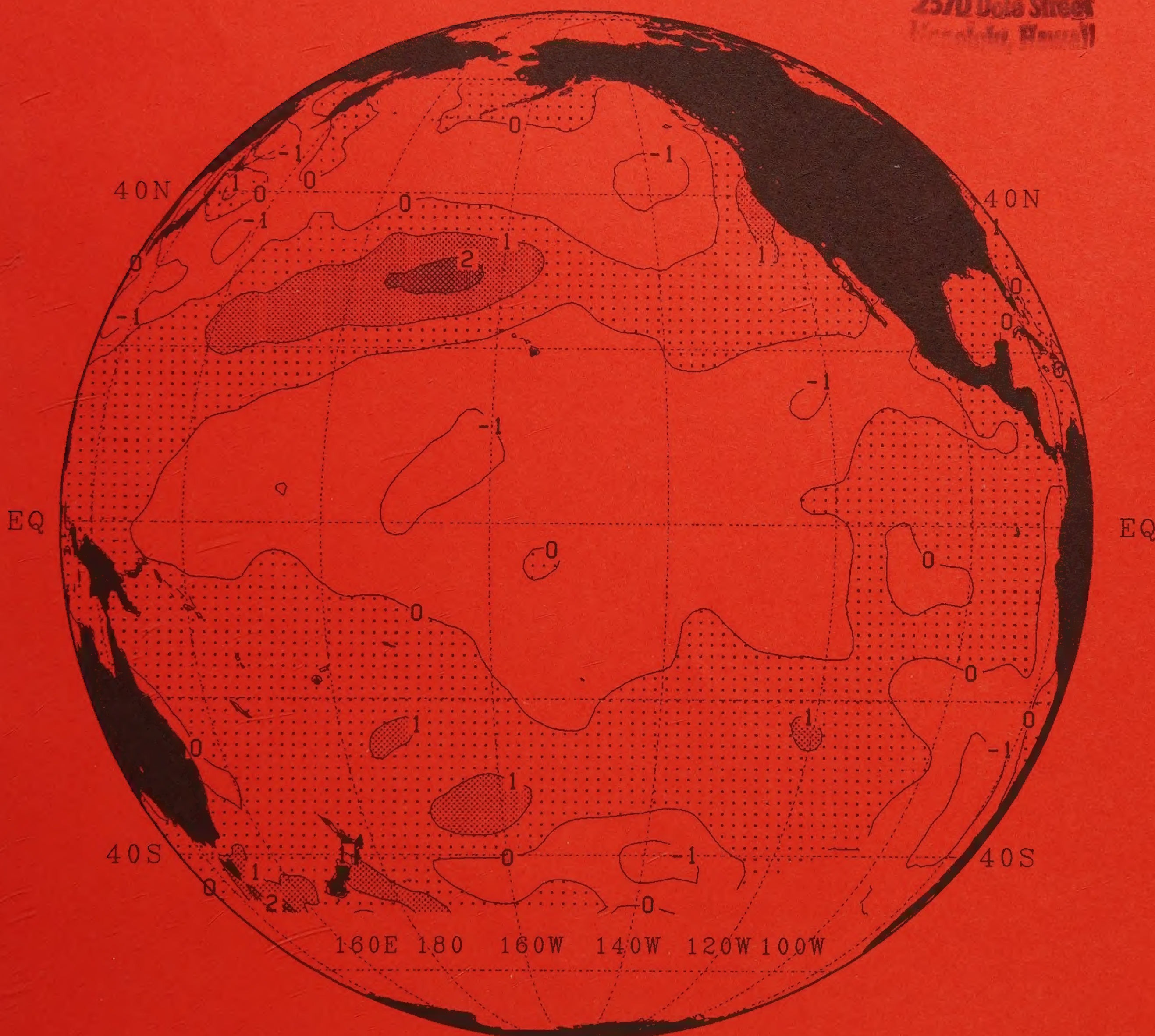
気象庁海洋月報

Monthly Ocean Report

May 2000 (No. 89)



Climate and Marine Department
Japan Meteorological Agency

気象庁 気候・海洋気象部

平成12年5月

気象庁海洋月報は、気象庁 気候・海洋気象部 海洋課で作成しています。
本月報に関する問い合わせは、

〒100-8122　東京都千代田区大手町１-３-４　気象庁 気候・海洋気象部 海洋課まで。
電　話 (03) 3212-8341 (内線 5128、5129)
ＦＡＸ (03) 3211-3047
電子メール ocean@hq.kishou.go.jp

Monthly Ocean Report is prepared by the Oceanographical Division, Climate and Marine Department, Japan Meteorological Agency.

Correspondence relating to this report may be directed to :

Masaro Saiki
Director, Oceanographical Division
Climate and Marine Department, Japan Meteorological Agency
1-3-4 Ote-machi, Chiyoda-ku, Tokyo 100-8122 Japan
Facsimile: +81-3-3211-3047
e-mail : ocean@hq.kishou.go.jp

表紙は、2000年5月の太平洋の月平均海面水温偏差図です。
陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for May 2000 in the Pacific Ocean.
Areas of positive anomalies are shaded.

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海況の特徴（２０００年５月）

日本近海の海況

海面水温は、本州南方の20°N、125°Eから35°N、160°Eにかけての海域、九州西方から日本海の西部及びオホーツク海南部で平年より1℃以上低かった。一方、宗谷海峡の西及び三陸沖の40°Nに沿った海域では平年より1℃以上高かった（第４図）。

黒潮は、九州から足摺岬にかけて接岸した後、離岸して、紀伊半島沖では東南東に流れていた。その後、東海沖で32°N付近まで南下した後、139°E付近で北に向きを変え、上・中旬は八丈島の西で北東に向きを変え、下旬は八丈島付近を北上し三宅島の西を流れた後、北東に向きを変え、房総半島沖を北東に流れていた（第９図）。

親潮系の冷水の沿岸寄りの分枝は39.5°N、144.0°Eまで、沖合の分枝は39.0°N、146.5°Eまで達していた（第5図）。

太平洋の海況

太平洋赤道域の海面水温は、165°Eから130°Wにかけての海域とエクアドル沿岸で平年より0.5℃以上低く、170°W付近では－1℃を超える負偏差が見られた。一方、150°E以西と120°Wから85°Wにかけての海域では平年より高かった。

北太平洋では、15°N、140°Eから35°N、155°Wにかけての海域で平年より0.5℃以上高く、特に、30°Nに沿った日付変更線から160°Wにかけては ＋2℃を超える正偏差が見られた。一方、45°N、135°Wを中心とする海域では－1℃を超える負偏差が見られた。南太平洋では、30°Sに沿った日付変更線から110°Wの海域で＋0.5℃を超える正偏差が広がっていた（第16図）。

Highlights May 2000

Seas adjacent to Japan

SSTs were more than 1°C below normal in the seas south of Honshu from 20°N, 125°E to 35°N, 160°E, from the seas west of Kyushu to the western part of Japan Sea and in the southern part of the Sea of Okhotsk. Positive SST anomalies exceeding +1°C prevailed west of Soya Strait and off Sanriku along 40°N (Fig. 4).

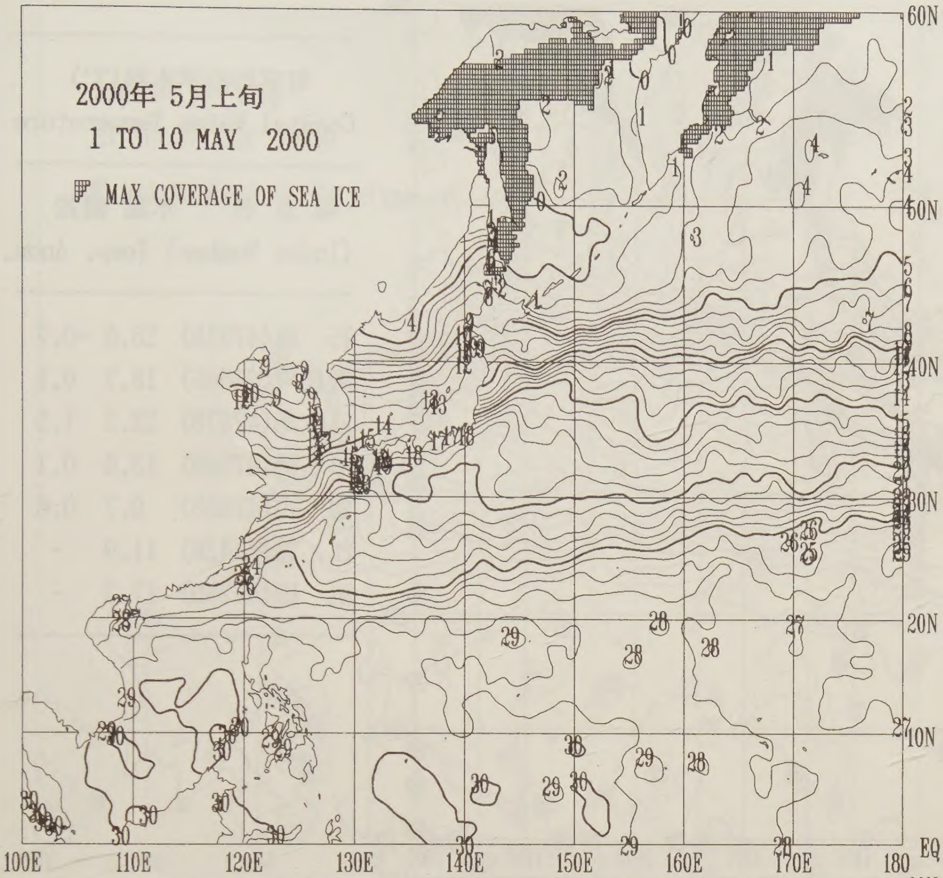
The Kuroshio flowed along the coasts from Kyushu to the Ashizuri-Misaki. Then it flowed ESE-ward off the Kii Peninsula. It flowed SE-ward to 32°N off Tokai, then turned northward along 139°E. The Kuroshio turned NE-ward west of Hachijo Island in the first and second 10-days of the month. In the rest of the month, it flowed northward near Hachijo Island and passed west of Miyake Island. Then it turned NE-ward and flowed off the Boso Peninsula (Fig. 9).

Coastal and off-coastal branches of the Oyashio cold water extended southward to 39.5°N, 144.0°E and 39.0°N, 146.5°E, respectively (Fig. 5).

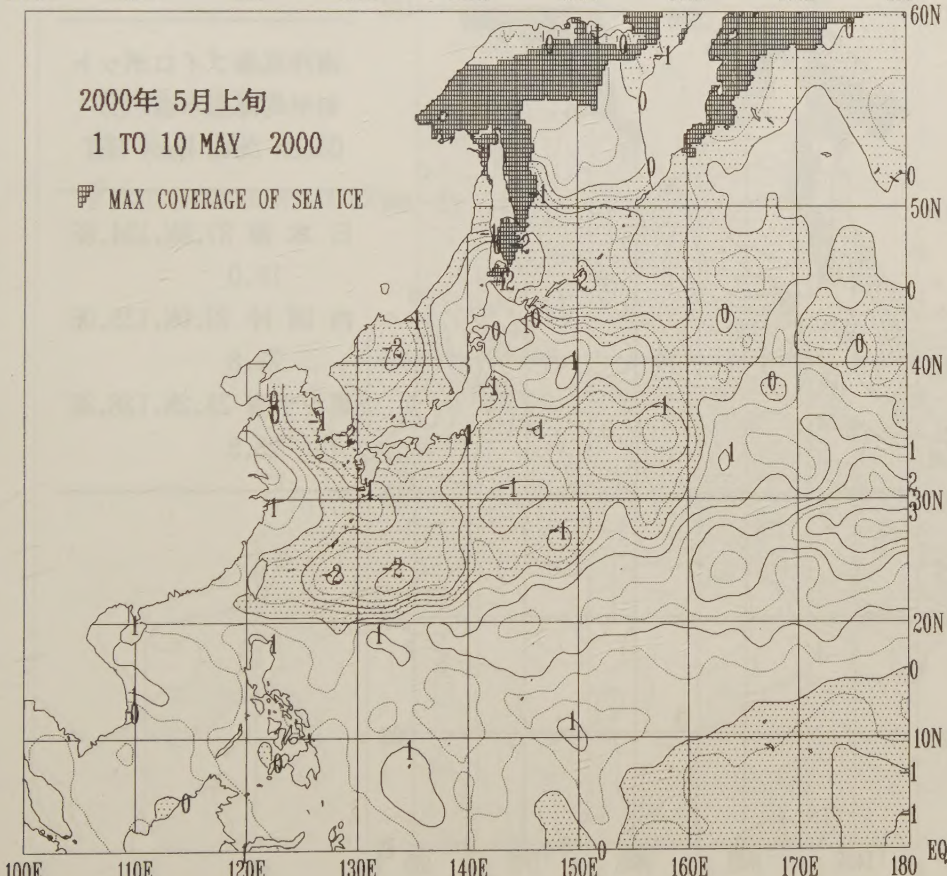
Pacific Ocean

In the equatorial Pacific, negative SST anomalies exceeding -0.5°C prevailed from 165°E to 130°W and off Ecuador, and those exceeding -1°C were found near 170°W. SSTs were above normal west of 150°E and from 120°W to 85°W.

In the North Pacific, positive SST anomalies exceeding +0.5°C prevailed from 15°N, 140°E to 35°N, 155°W, and those exceeding +2°C were found from the dateline to 160°W along 30°N. Negative SST anomalies exceeding -1°C were found around 45°N, 135°W. In the South Pacific, positive SST anomalies exceeding +0.5℃ prevailed from the date line to 110°W along 30°S (Fig. 16).



旬平均沿岸水温(℃) Coastal Water Temperature		
地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	24.5	-1.1
御前崎(47655)	16.7	-0.8
八丈島(47678)	19.9	0.1
小名浜(47598)	12.7	0.7
宮　古(47585)	9.3	1.1
江　差(47428)	11.2	-
浜　田(47755)	16.5	-

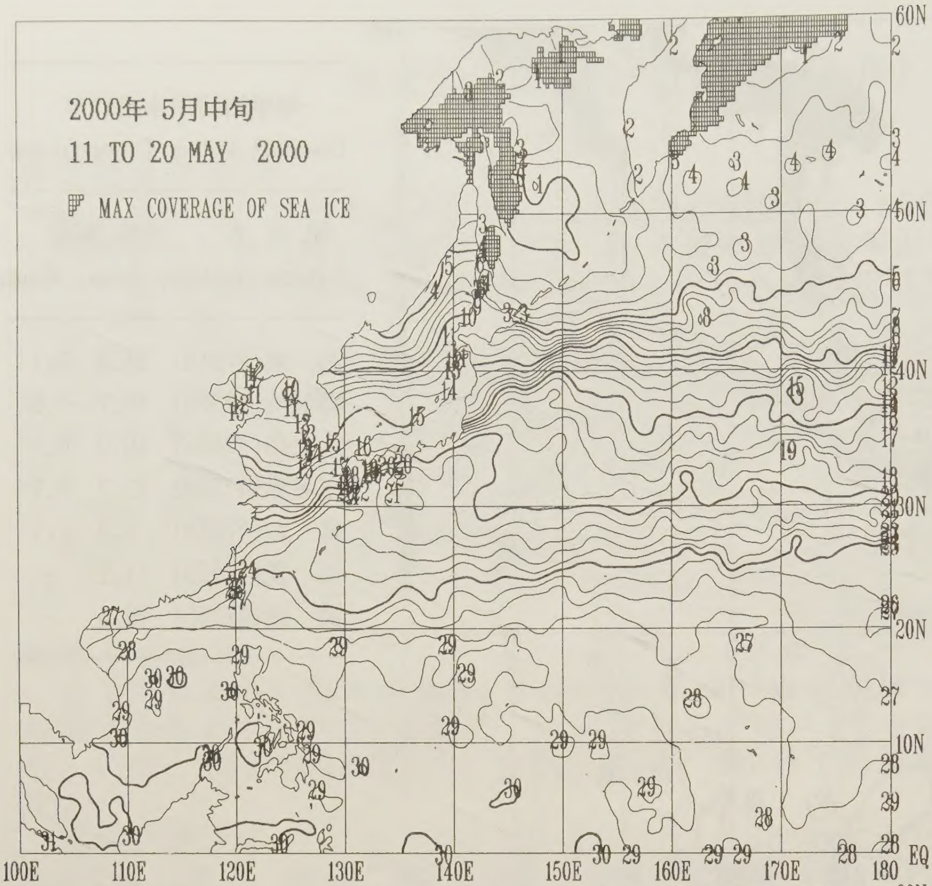


海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日 本 海 37.9N,134.5E	13.0
四 国 沖 29.0N,135.0E	21.1
東シナ海 28.2N,126.3E	23.9

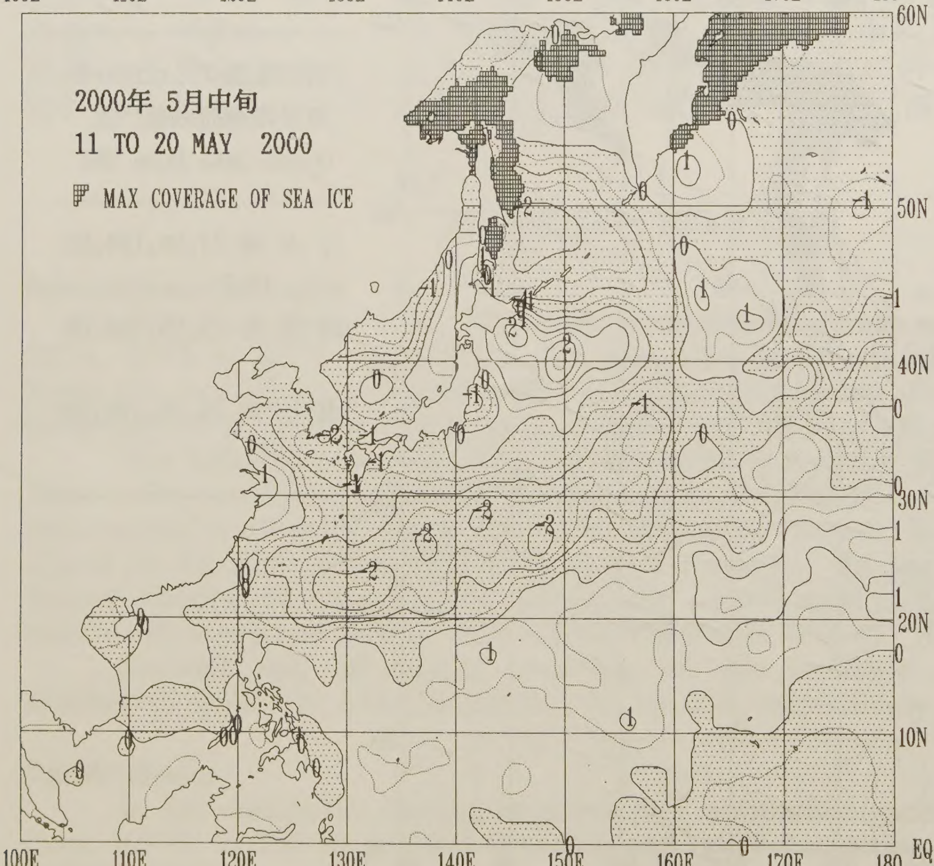
第1図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2000年 5月上旬)

Fig.1 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 1st ten-day period in MAY 2000. Anomalies are computed from the JMA climatology (1961-90). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



旬平均沿岸水温(℃)
Coastal Water Temperature

地 点 名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	25.5	-0.7
御前崎(47655)	18.7	0.1
八丈島(47678)	22.2	1.5
小名浜(47598)	13.0	0.1
宮　古(47585)	9.7	0.6
江　差(47428)	11.9	-
浜　田(47755)	17.2	-

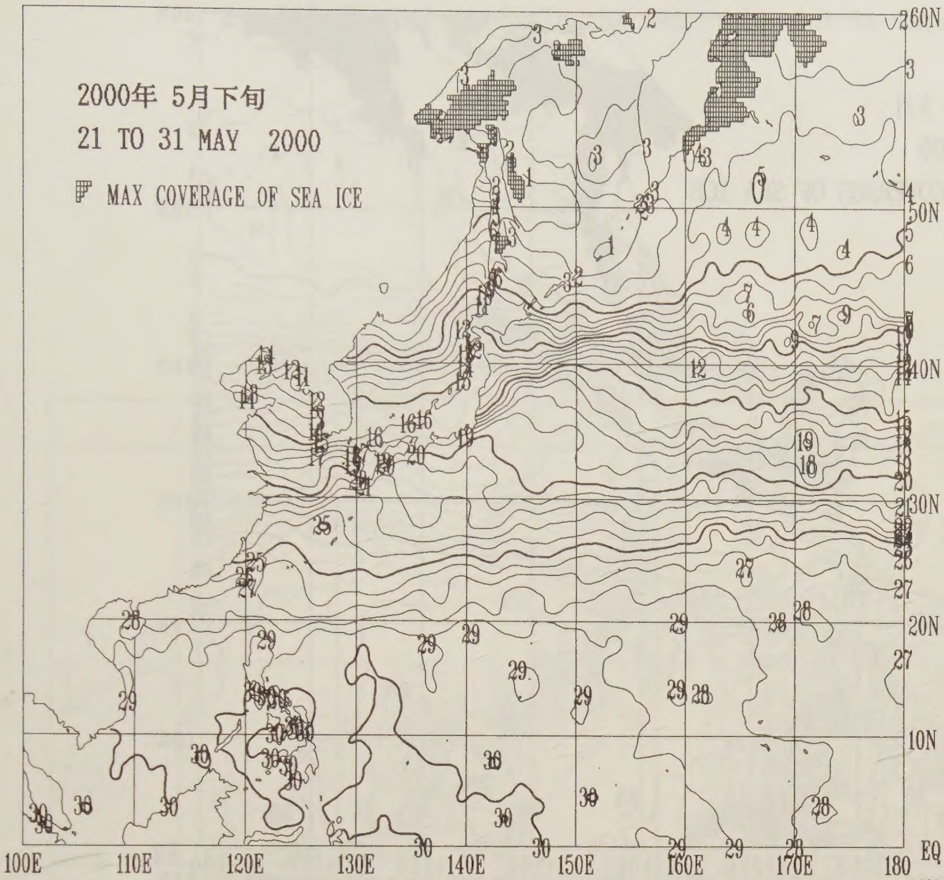


海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日 本 海	37.9N,134.5E	15.0
四 国 沖	29.0N,135.0E	23.8
東シナ海	28.2N,126.3E	25.5

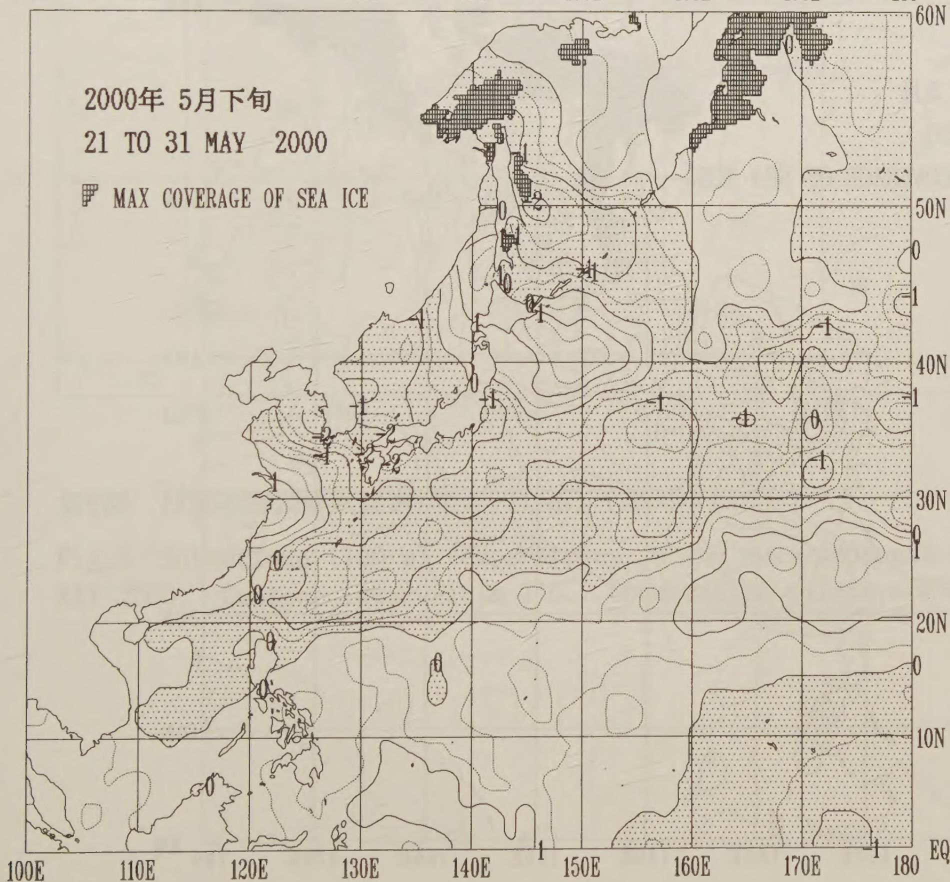
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Fig.2 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 2nd ten-day period in MAY 2000. Anomalies are computed from the JMA climatology (1961-90). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	26.0	-0.5
御前崎(47655)	19.6	0.0
八丈島(47678)	21.8	0.7
小名浜(47598)	13.6	0.2
宮　古(47585)	10.9	0.7
江　差(47428)	13.6	-
浜　田(47755)	19.0	-



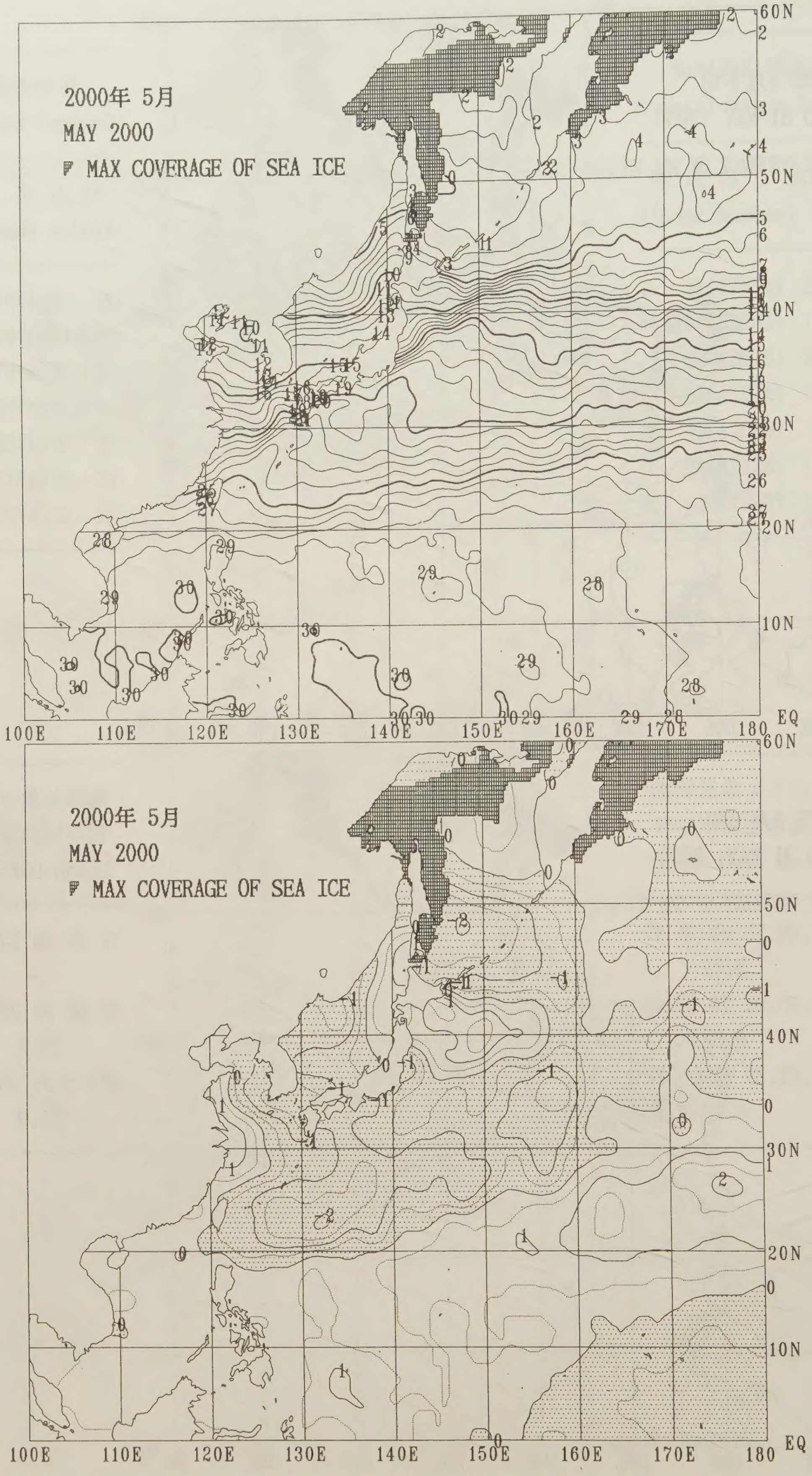
海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

地点	位置	水温
日本海	37.9N,134.5E	-
四国沖	29.0N,135.0E	22.8
東シナ海	28.2N,126.3E	25.0

第3図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2000年 5月下旬)

Fig.3 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 3rd ten-day period in MAY 2000. Anomalies are computed from the JMA climatology (1961-90). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

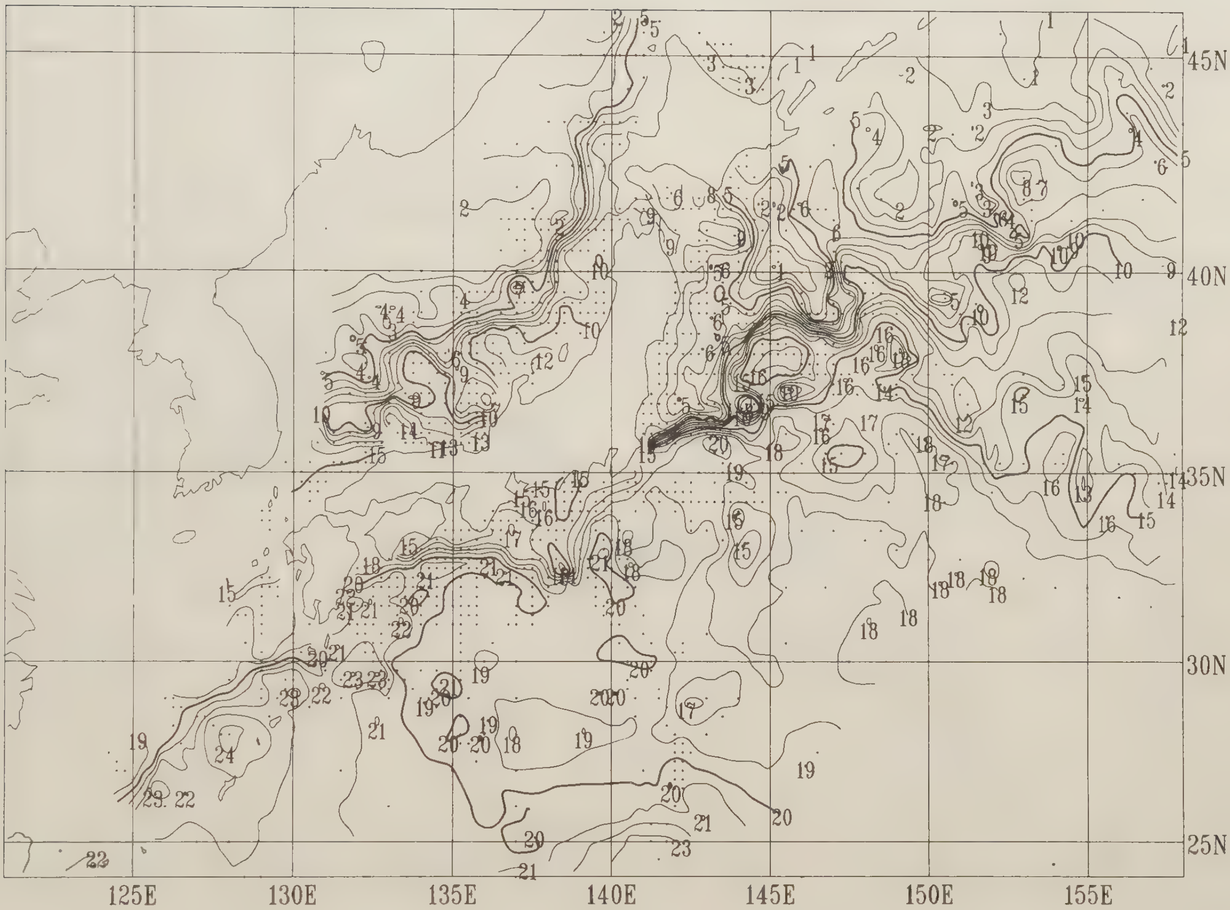
Monthly Mean SST & Anomalies



第4図 北西太平洋月平均海面水温図(上)及び偏差図(下)(2000年 5月)

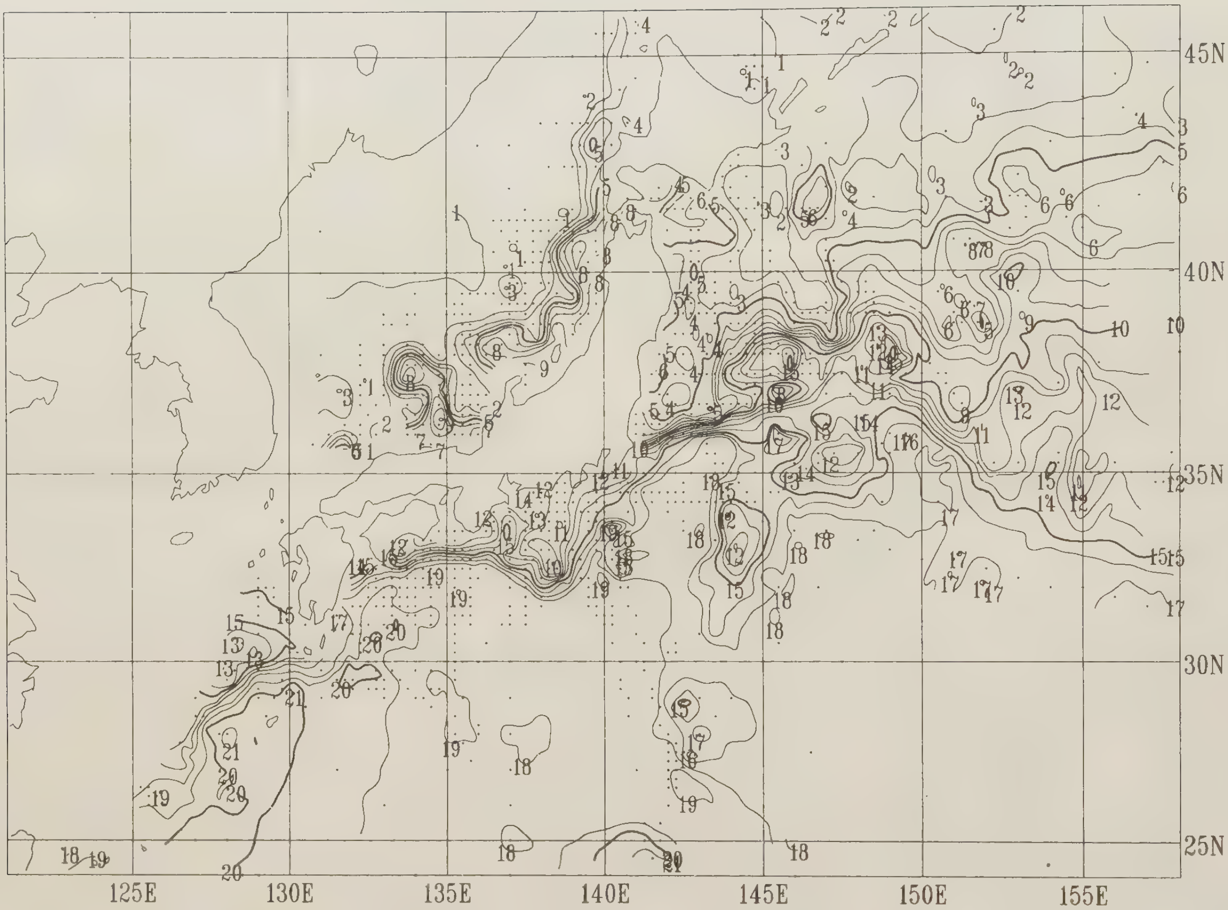
Fig.4 Monthly mean SST (top) and anomalies (bottom) in the western North Pacific for MAY 2000. Anomalies are computed from the JMA climatology (1961-1990). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

100m Temperatures in the Seas Adjacent to Japan



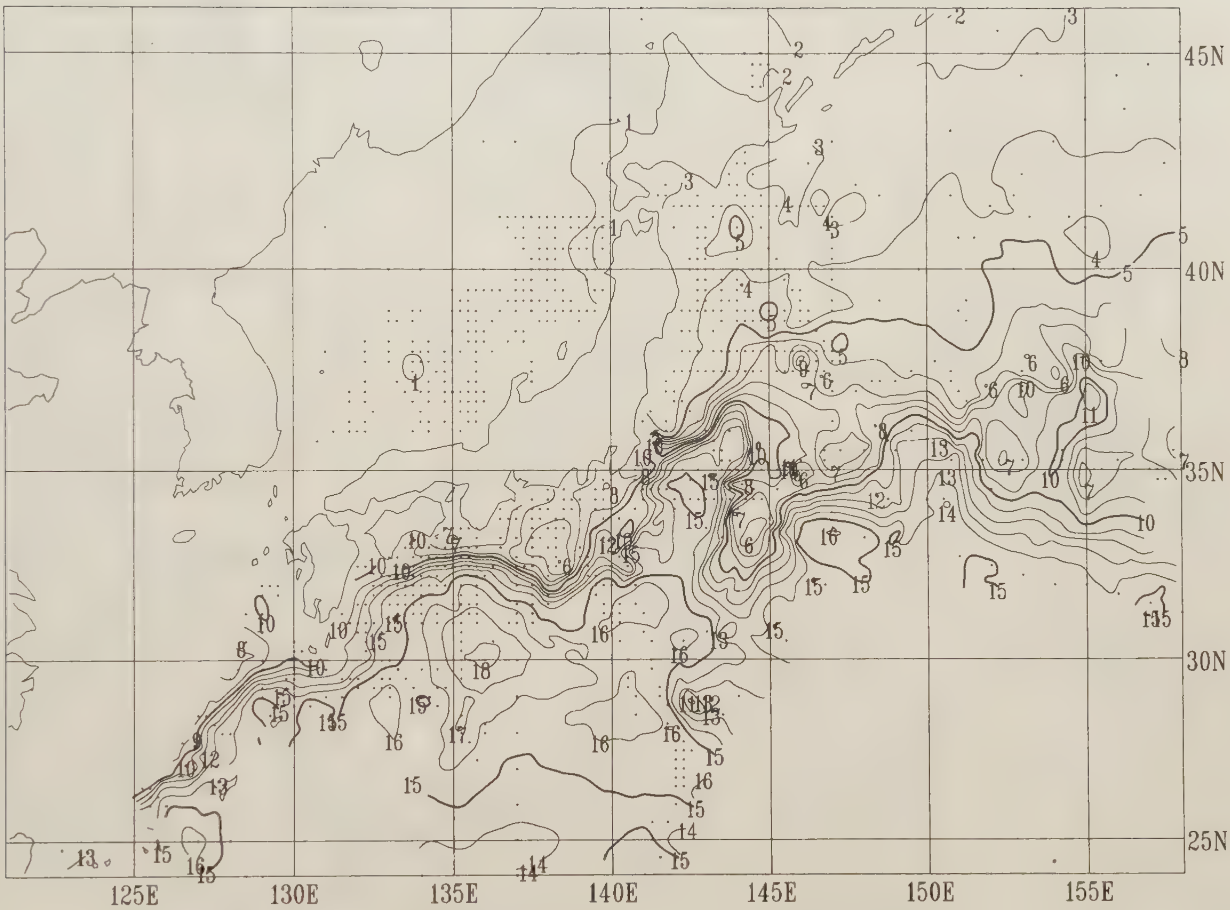
第5図　日本近海表層水温図(深さ100 m) (2000年 5月)

Fig.5 Subsurface (100 m) temperatures in the seas adjacent to Japan for MAY 2000. Contour interval is 1°C. Observation points are denoted by dots.



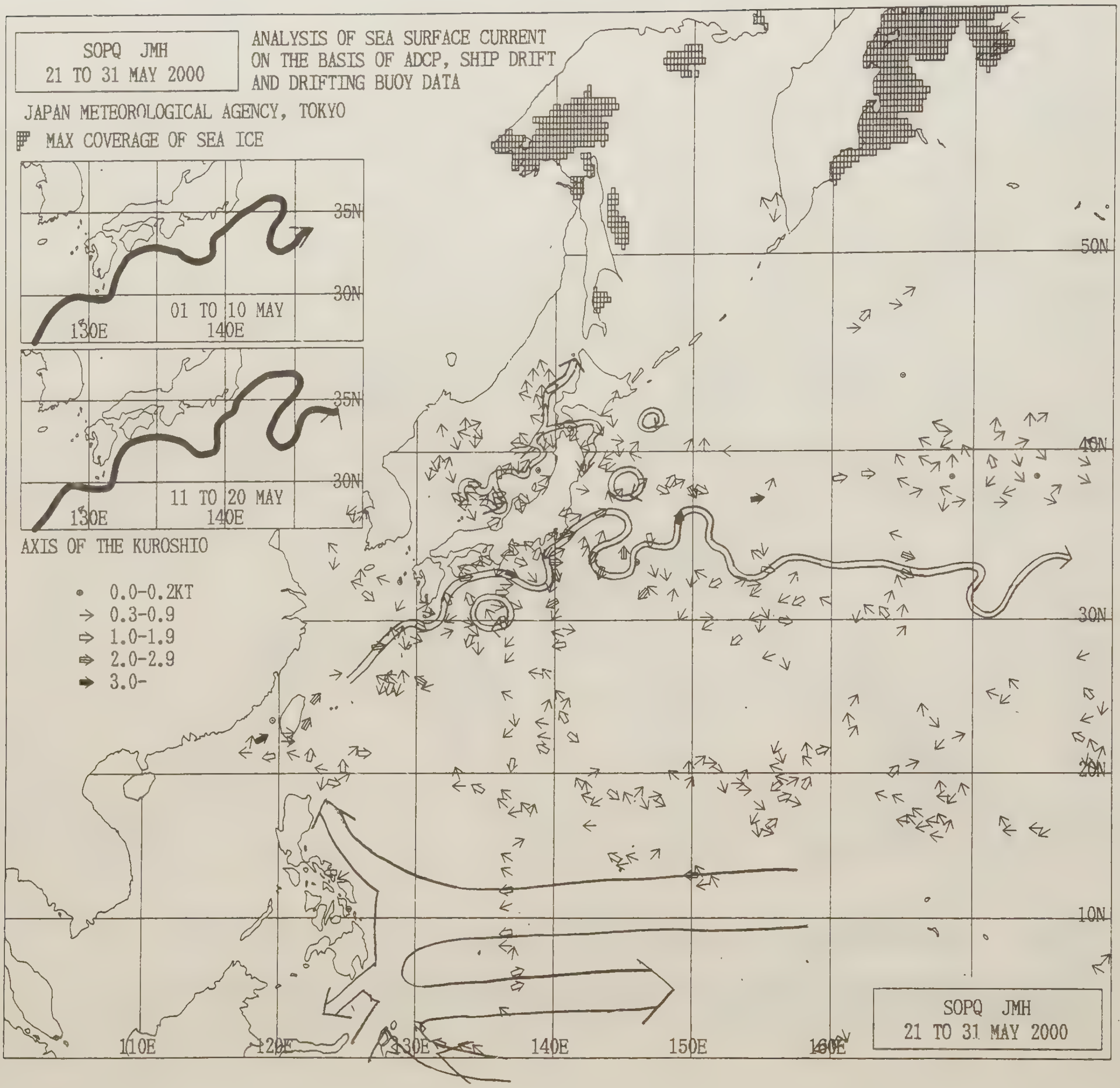
第6図　日本近海表層水温図(深さ200 m) (2000年 5月)

Fig.6 Subsurface (200 m) temperatures in the seas adjacent to Japan for MAY 2000. Contour interval is 1°C. Observation points are denoted by dots.



第7図　日本近海表層水温図(深さ400 m) (2000年 5月)

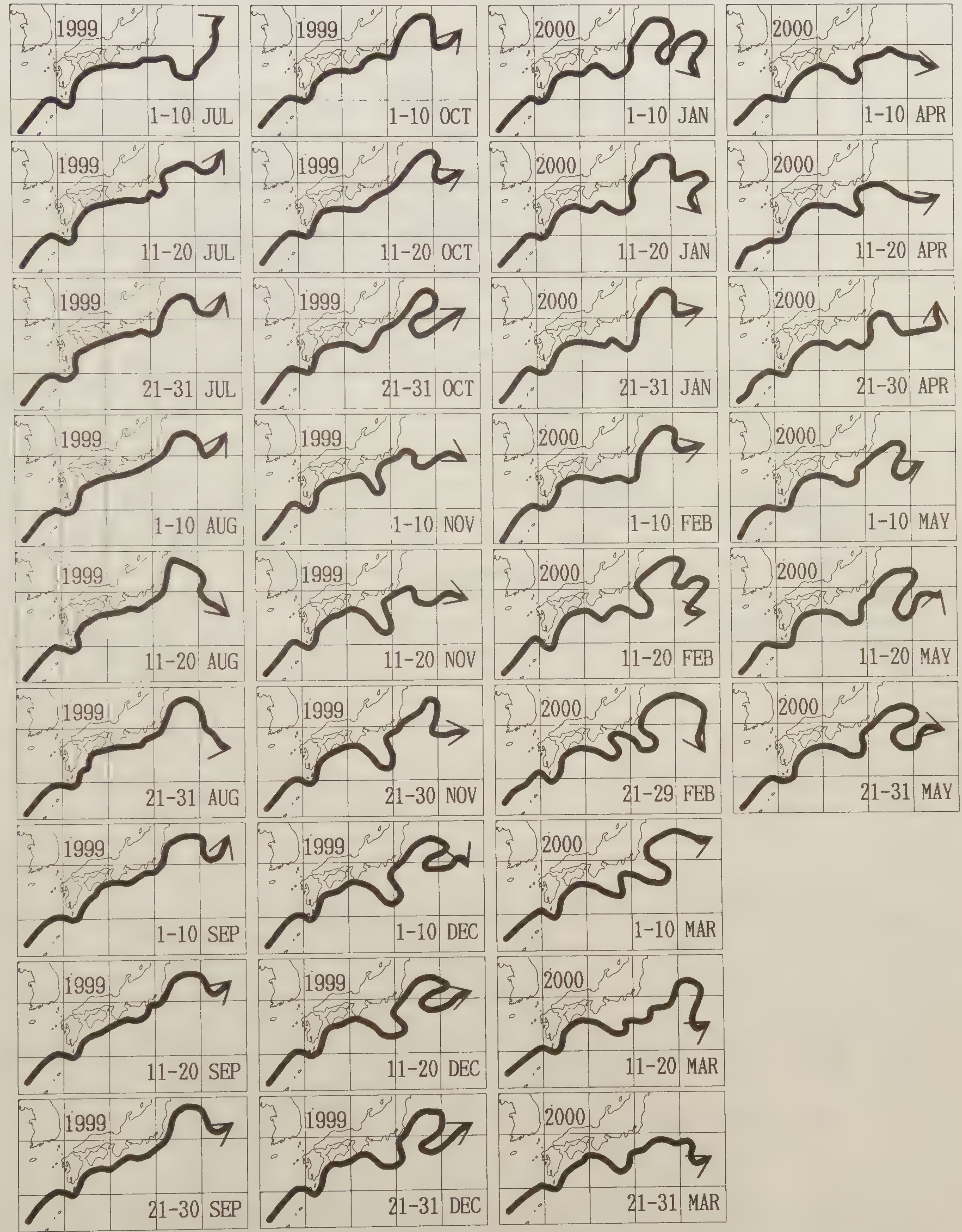
Fig.7 Subsurface (400 m) temperatures in the seas adjacent to Japan for MAY 2000. Contour interval is 1°C. Observation points are denoted by dots.



第 8 図　北西太平洋海流図（2000 年 5 月下旬）

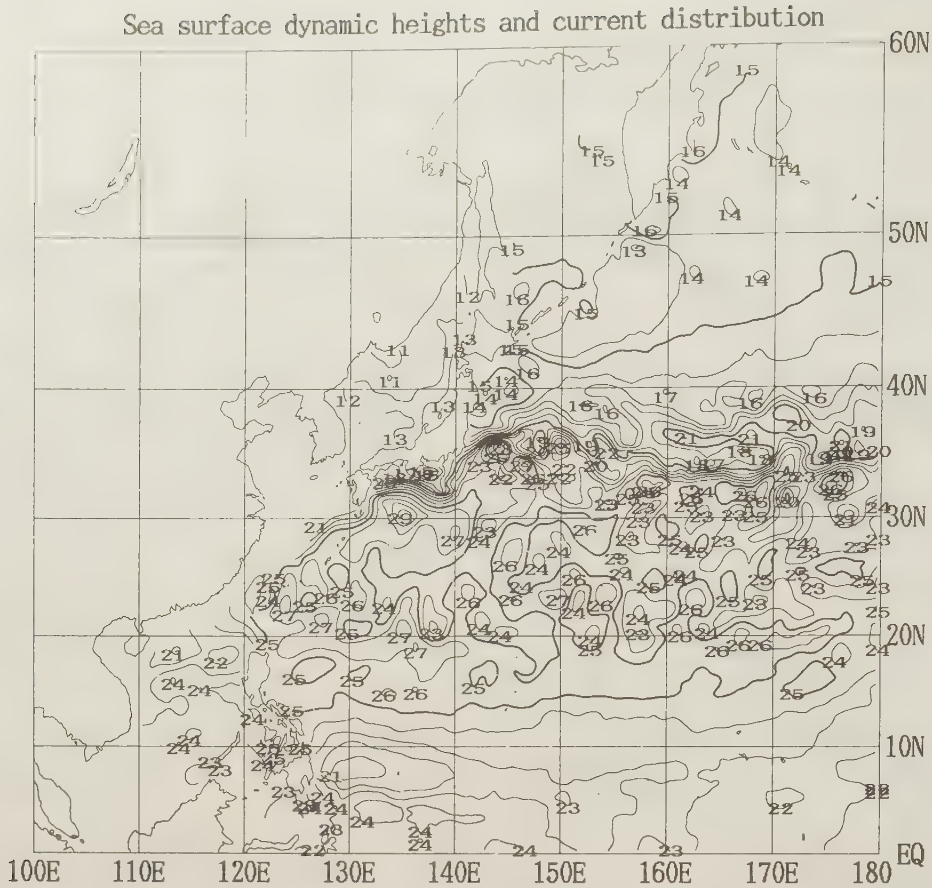
Fig. 8　Analysis of the sea surface current in the western North Pacific for the 3rd ten-day period in May 2000. Small arrows indicate *in situ* observations. Major currents such as the Kuroshio and the North Equatorial Current are denoted by larger open arrows.

Location of the Kuroshio axis



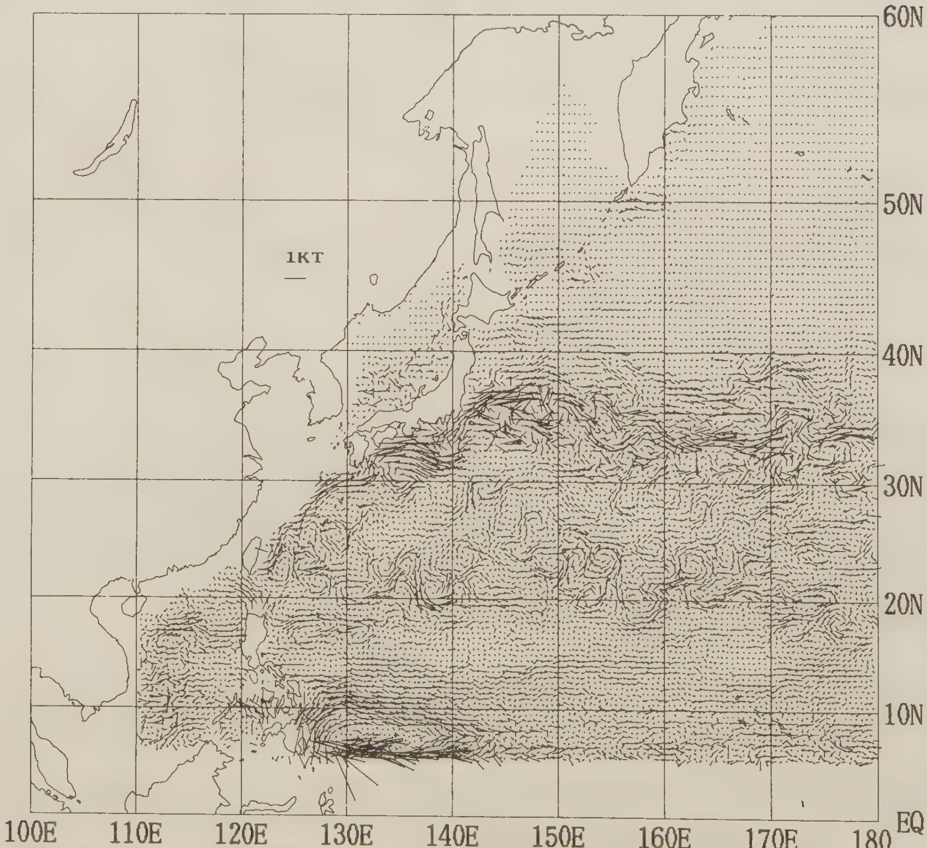
第9図 旬別黒潮流軸図

Fig.9 Location of the Kuroshio axis



第10図 北西太平洋力学的海面高度分布図(2000年 5月25日)

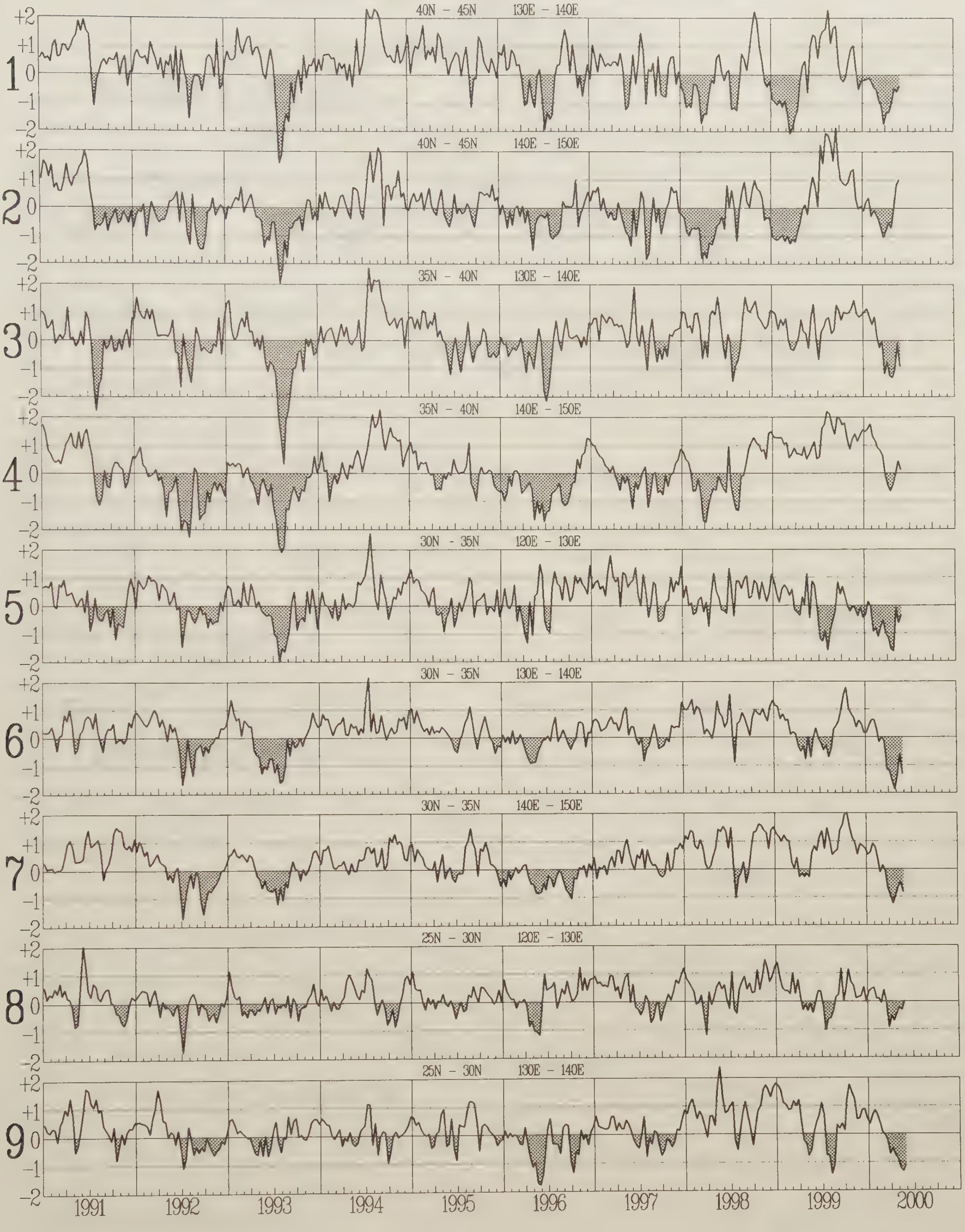
Fig.10 Sea surface dynamic heights (10 cm) in the western North Pacific derived from the altimeter data of TOPEX/POSEIDON (MAY 25, 2000).
1500 db surface is assumed to be the surface of no motion.

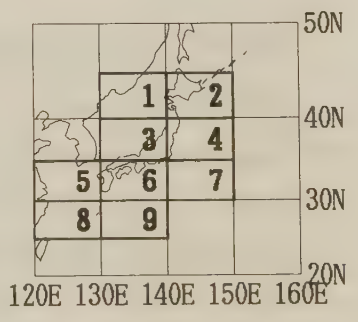


第11図 北西太平洋海流ベクトル図(2000年 5月25日)

Fig.11 Sea surface current vectors in the western North Pacific (MAY 25, 2000). Vectors are derived from the sea surface dynamic heights from TOPEX/POSEIDON and subsurface temperature distribution assuming the geostrophic relation.

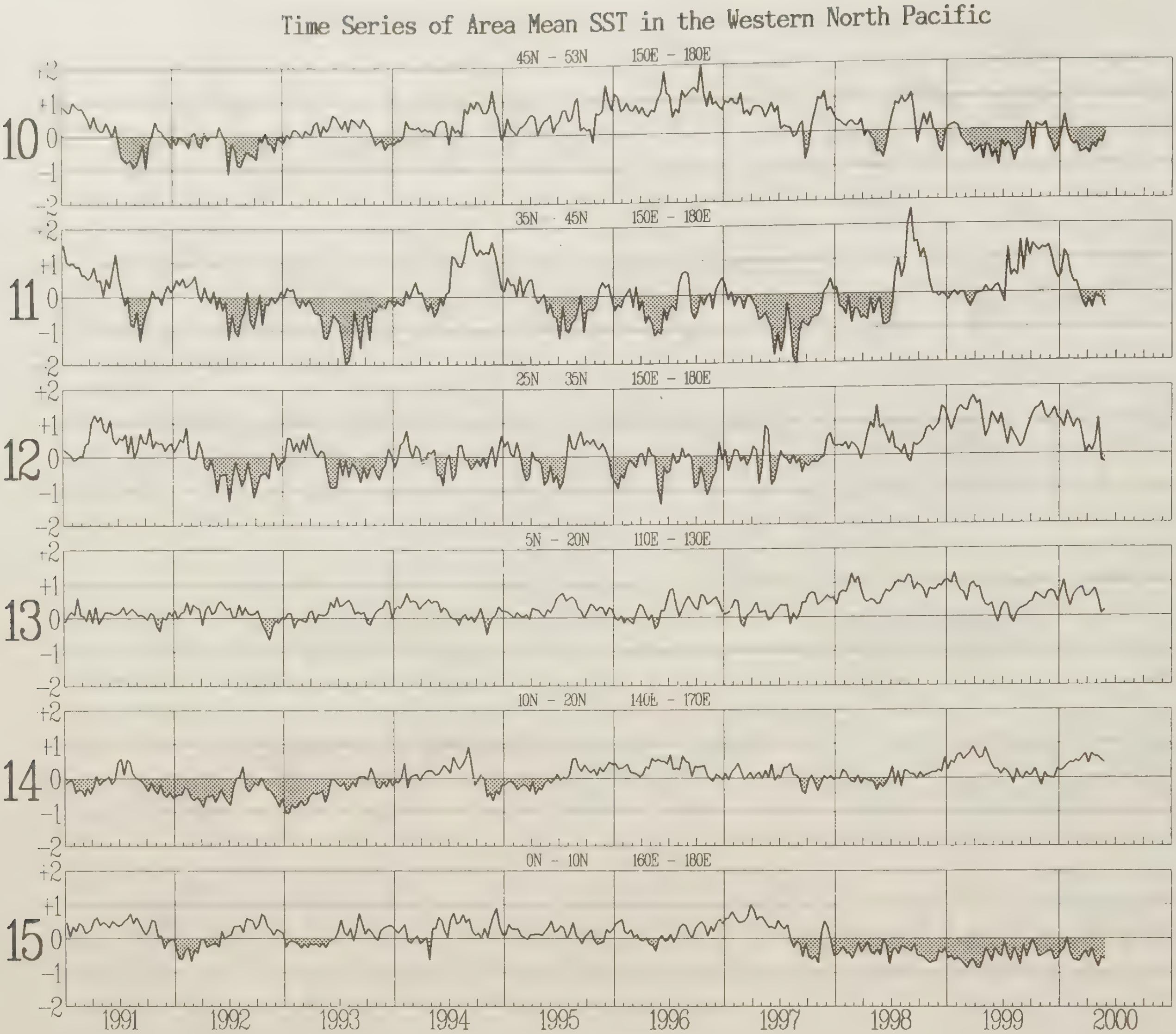
Time Series of Area Mean SST in the Western North Pacific





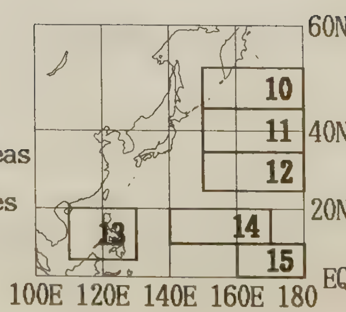
第12図　海域別旬平均海面水温平年偏差時系列図

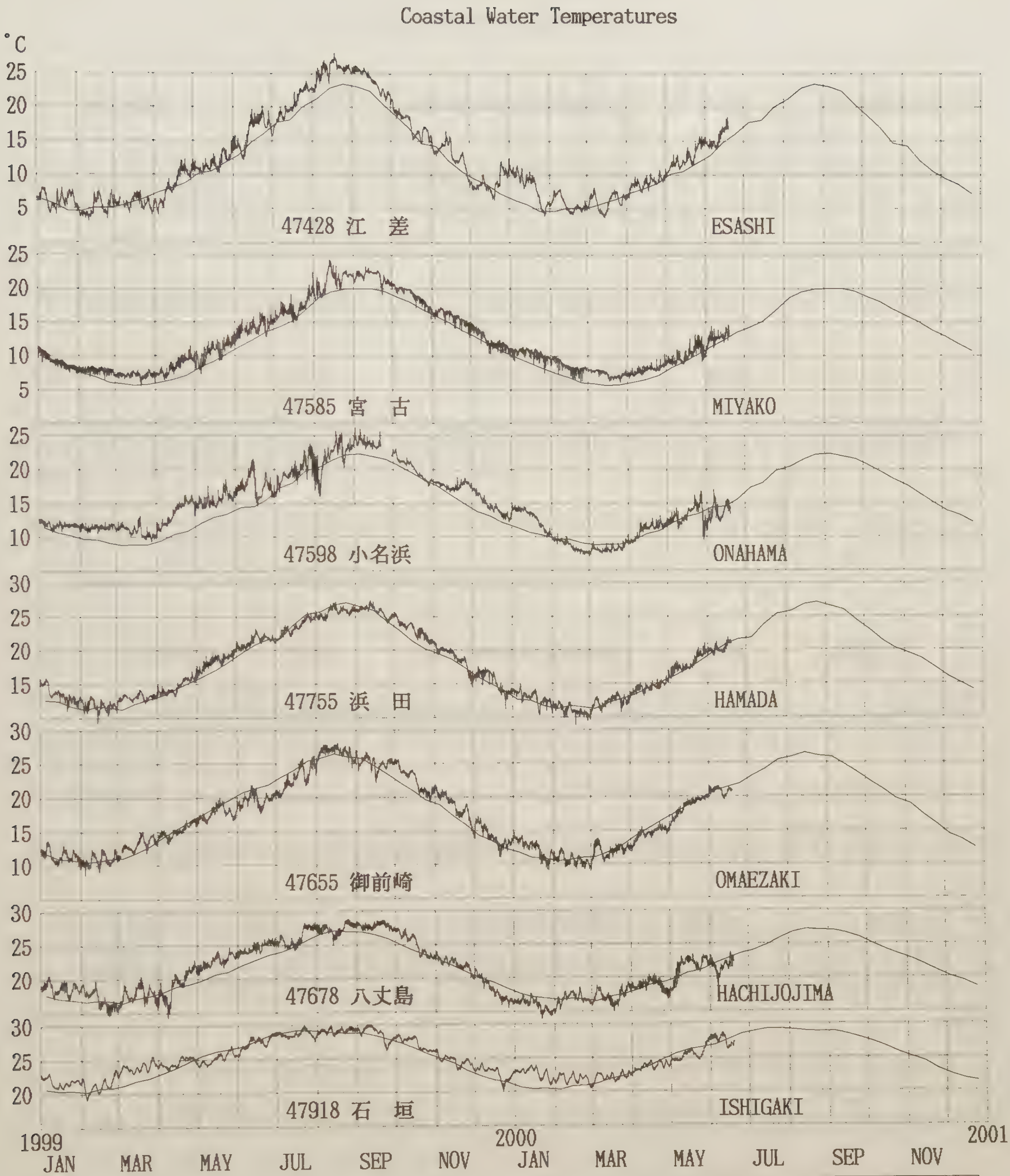
Fig.12 Time series of the ten-day mean sea surface temperature anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1961-90).



第12図　海域別旬平均海面水温平年偏差時系列図（つづき）

Fig.12 (continue) Time series of the ten-day mean sea surface temperature anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1961-90).

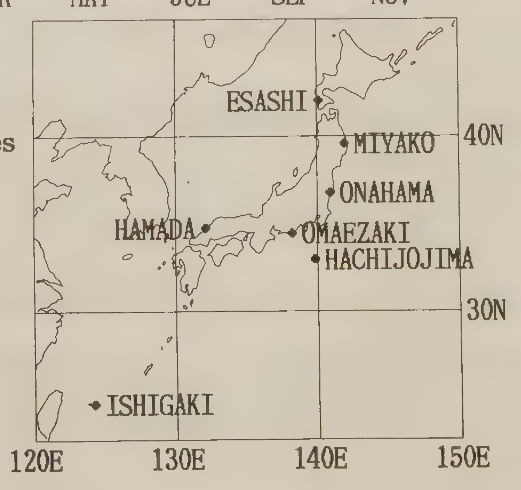


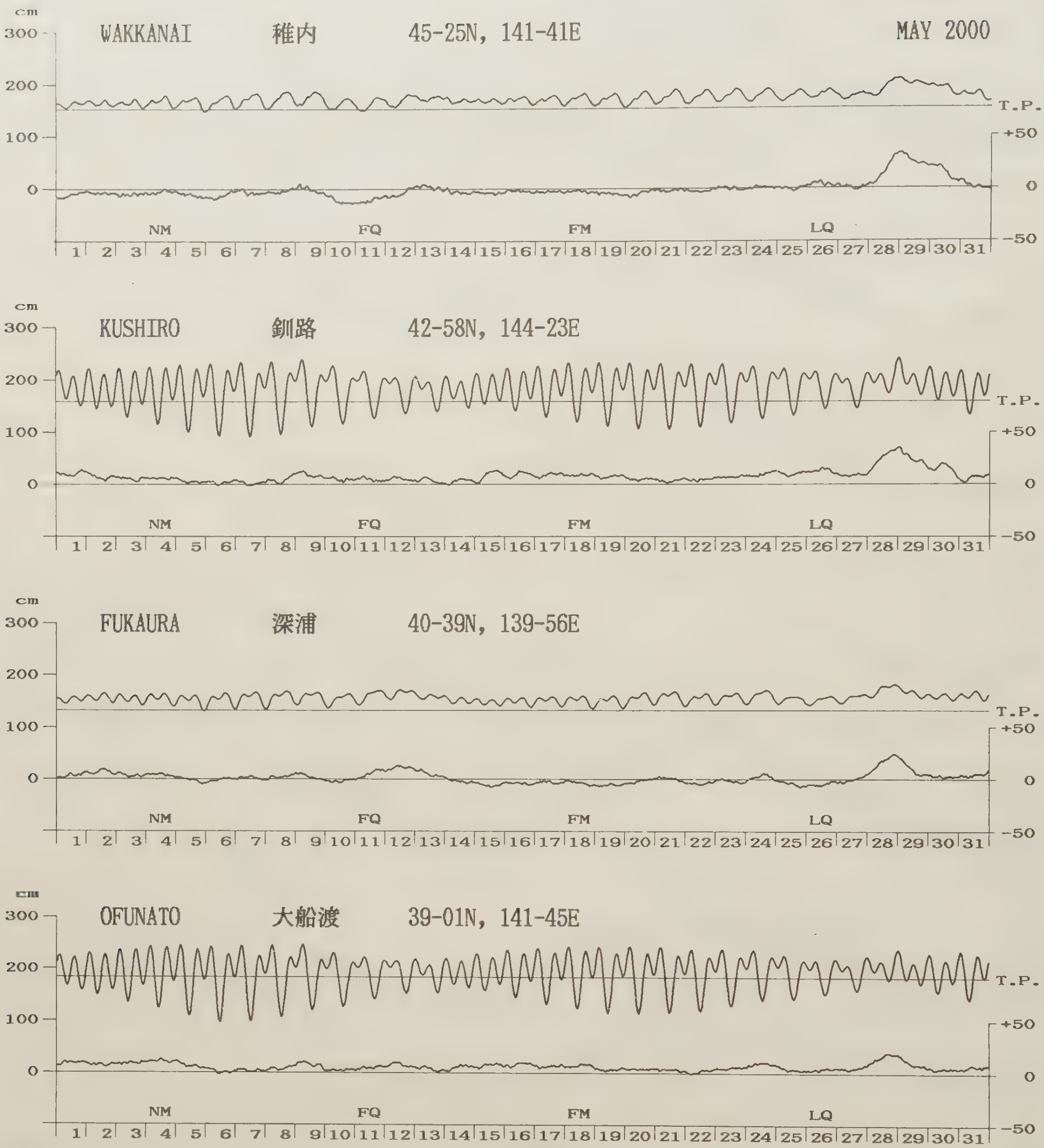


第13図 沿岸水温時系列図

Fig.13 Time series of hourly coastal water temperatures (°C) measured at 7 coastal stations of the JMA shown in the right panel.

Thin lines show ten-day mean climatology.

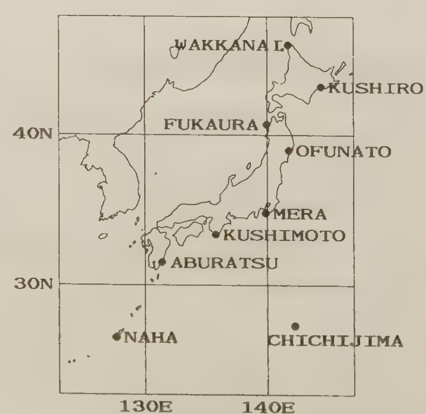




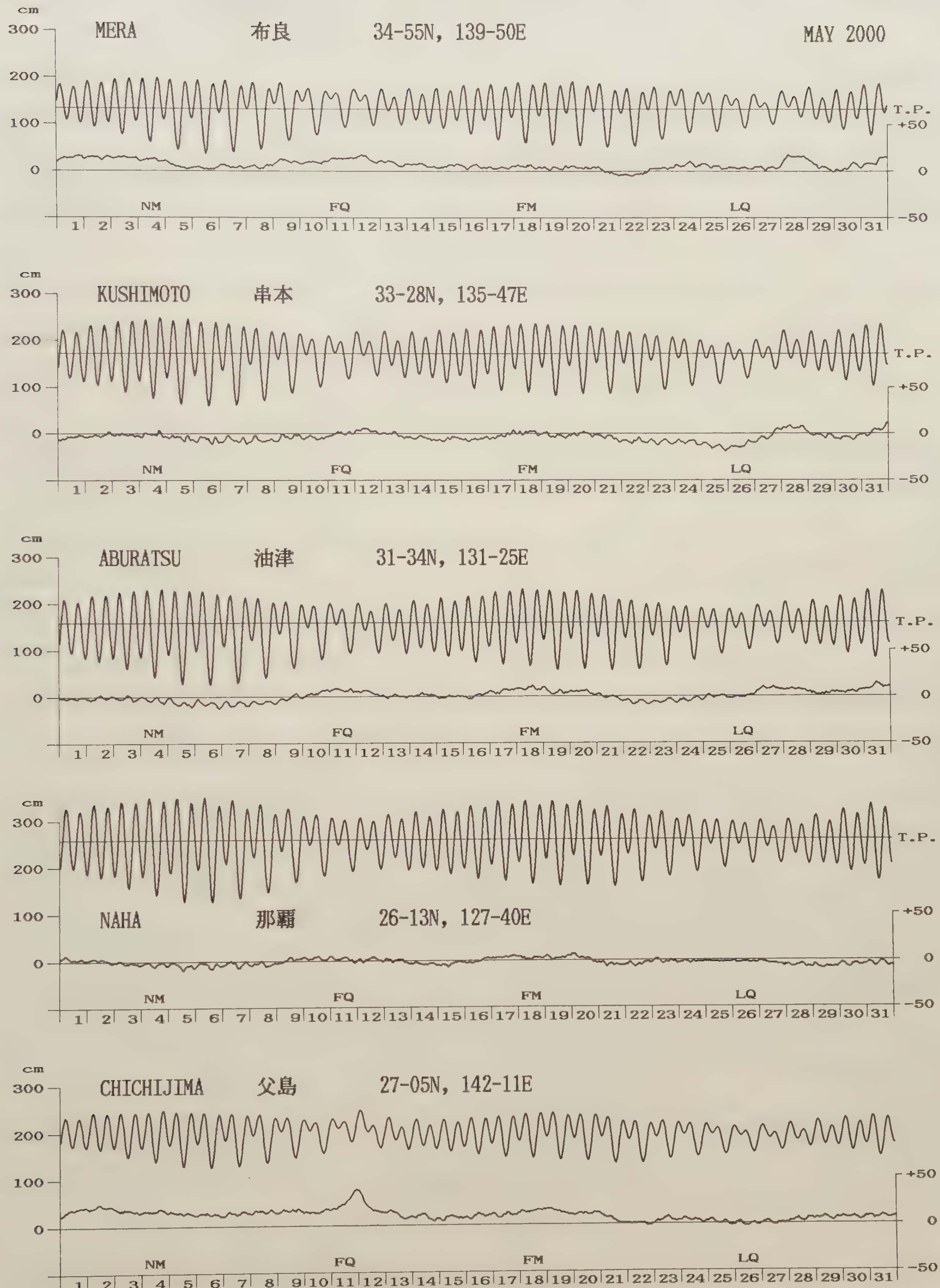
第14図 沿岸潮位時系列図 (2000年 5月)

Fig.14 Time series of hourly sea level observation (upper line) and its anomalies (lower line) at 9 stations of the JMA in the right panel.
Short term variations are removed from raw data.

NM: new moon, FQ: first quarter
FM: full moon, LQ: last quarter
T.P.: Mean sea level of Tokyo Bay (Tokyo Peil)

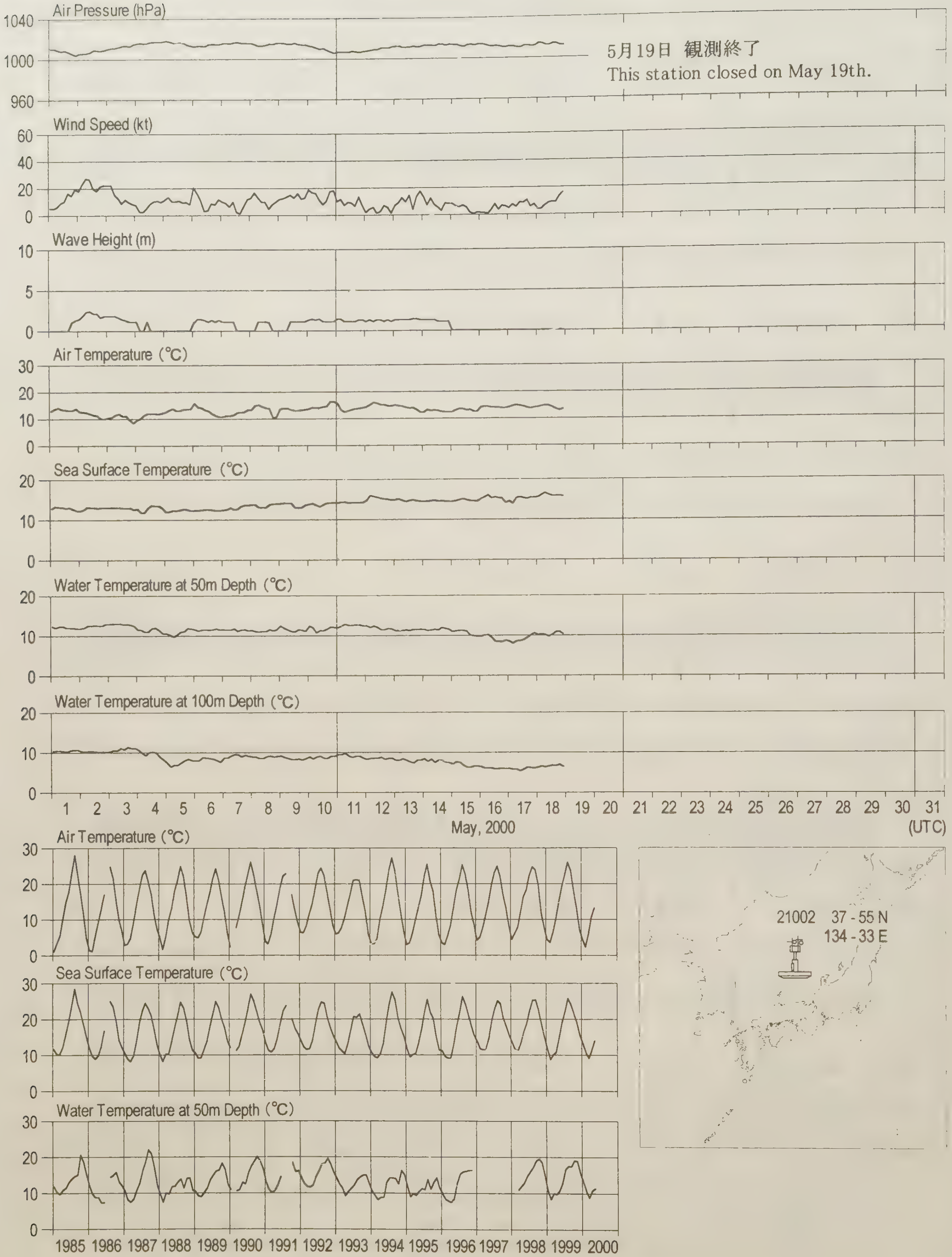


Time series of Sea Level



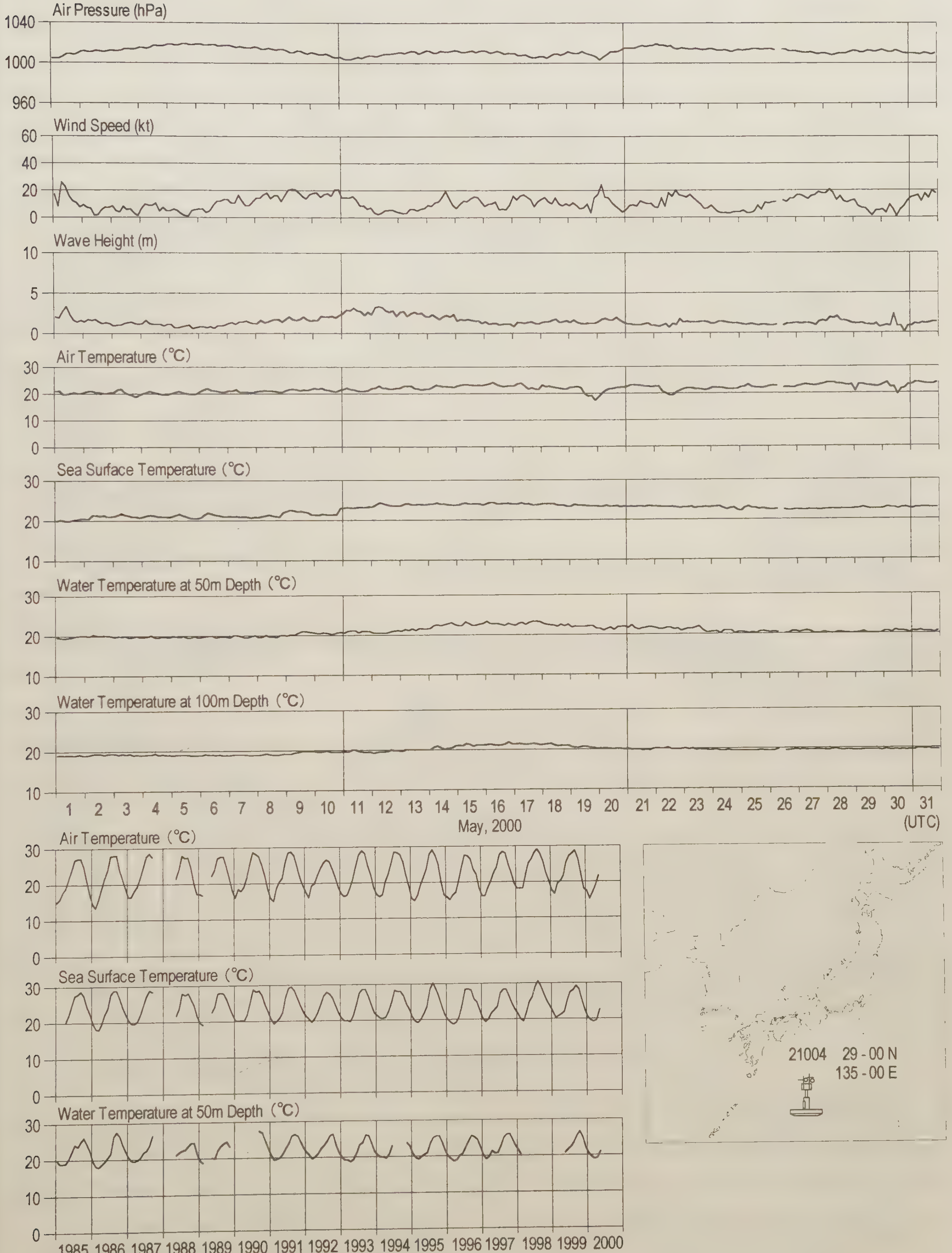
第14図 つづき

Fig.14 continue



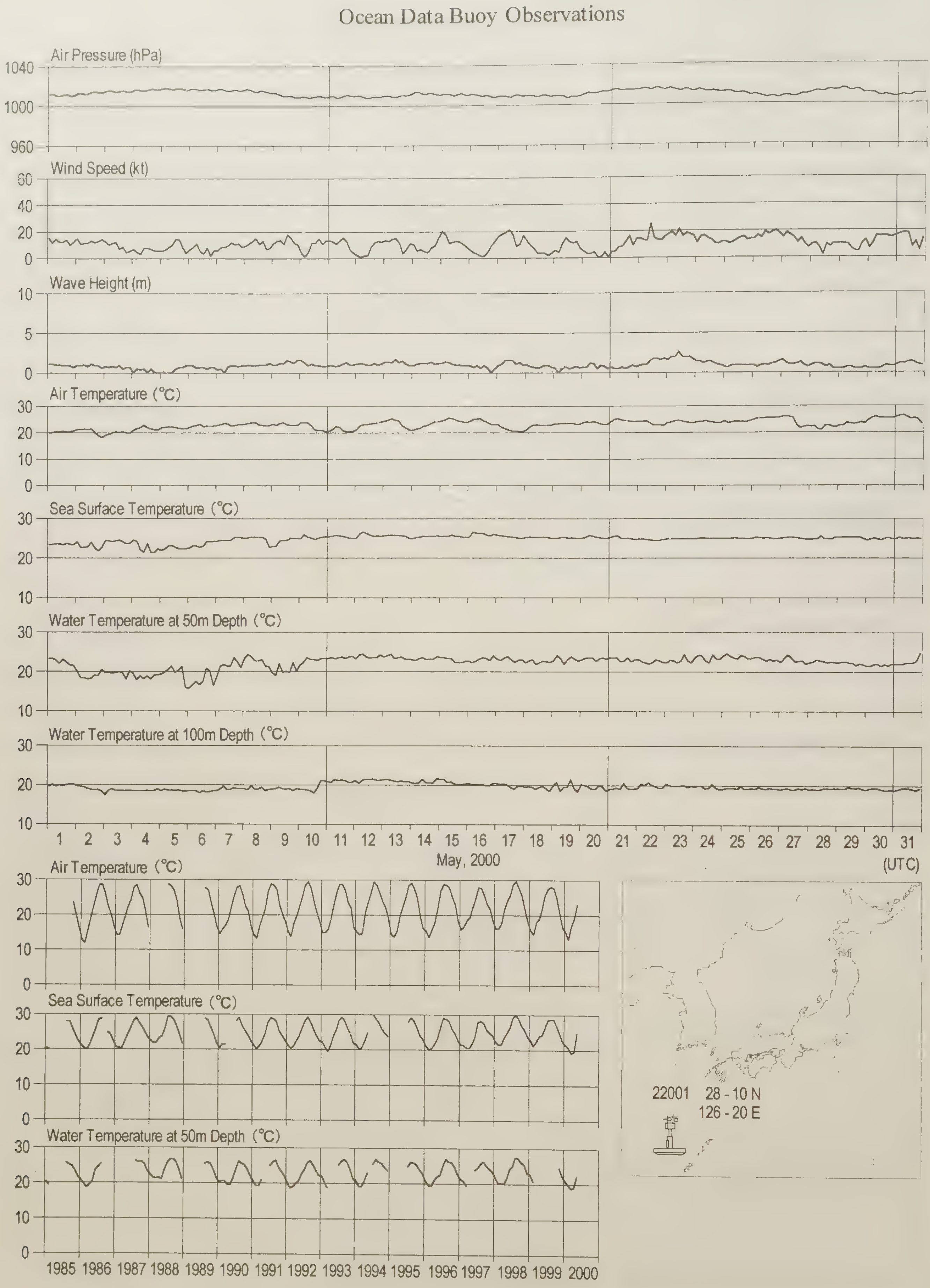
第15図　　海洋気象ブイロボットによる観測要素の時系列図（日本海：21002）
上段は３時間毎の観測値を、下段は月平均値を示す。

Fig.15　　Time series of JMA buoy observation in the Japan Sea (WMO ID No. 21002).
The upper panel shows three hourly observation and the lower panel shows the monthly mean data.



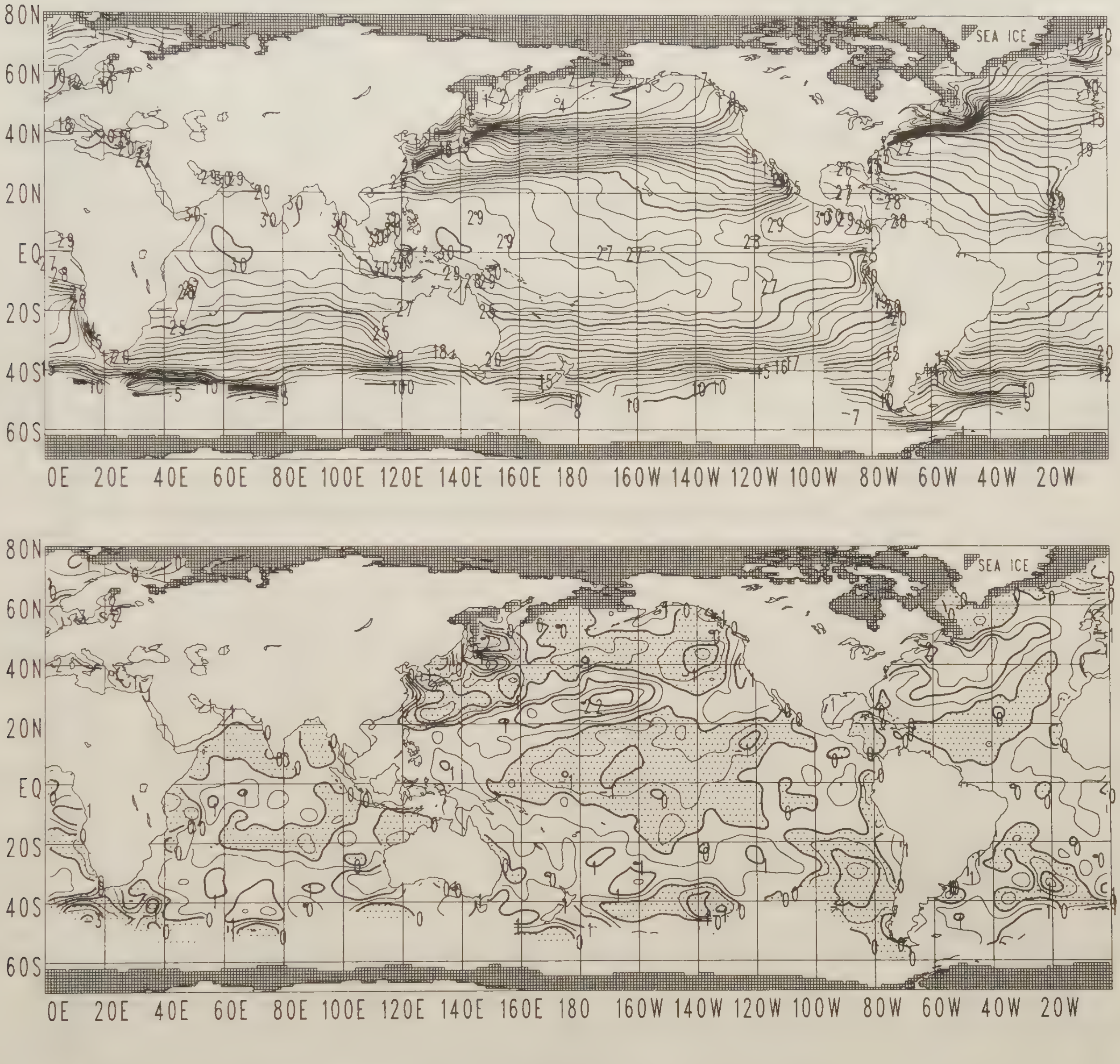
第15図　海洋気象ブイロボットによる観測要素の時系列図（四国沖：21004）
上段は３時間毎の観測値を、下段は月平均値を示す。

Fig.15　Time series of JMA buoy observation south of Shikoku (WMO ID No. 21004).
The upper panel shows three hourly observation and the lower panel shows the monthly mean data.



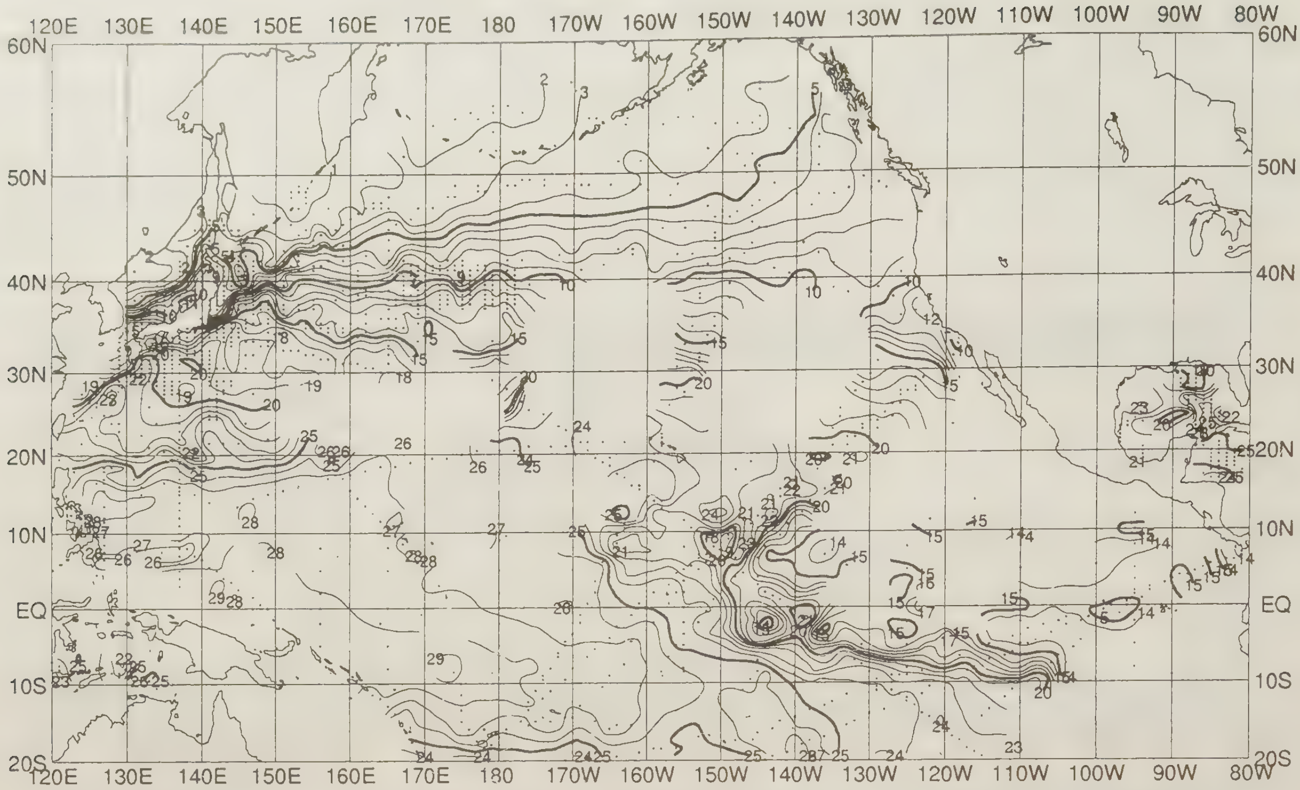
第15図　海洋気象ブイロボットによる観測要素の時系列図（東シナ海：22001）
上段は３時間毎の観測値を、下段は月平均値を示す。

Fig.15　Time series of JMA buoy observation in the East China Sea (WMO ID No. 22001).
The upper panel shows three hourly observation and the lower panel shows the monthly mean data.



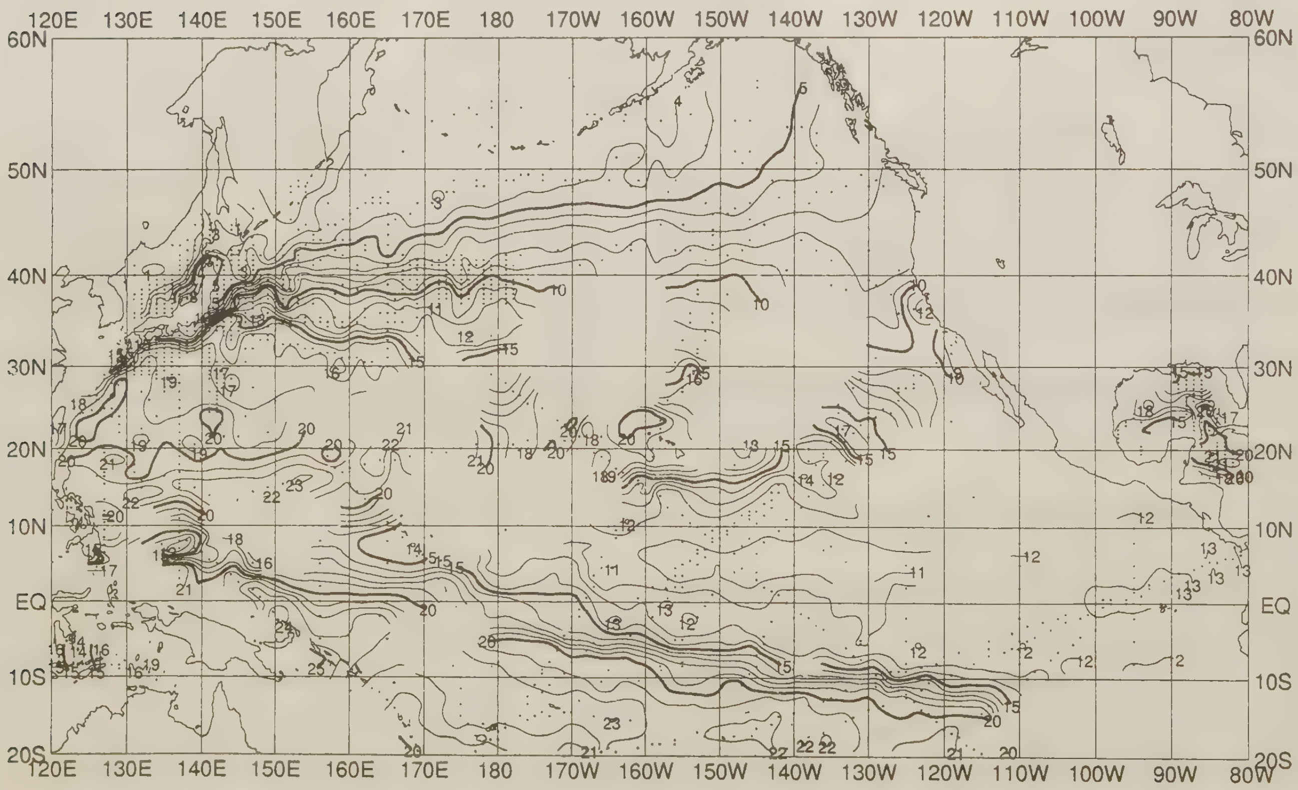
第16図　全球月平均海面水温図（上）及び偏差図（下）（2000年 5月）

Fig.16 Monthly mean sea surface temperature over the global ocean (top) and anomalies (bottom) for MAY 2000. Anomalies are computed from the JMA climatology (1961-1990). Contour interval is 1°C (top) and additional anomaly contours of ±0.5°C are shown by thin lines. Negative anomalies are spotted. Maximum coverage of sea ice is shaded. Data sources for sea ice are U.S. National Ice Center (polar regions) and JMA (the Sea of Okhotsk).



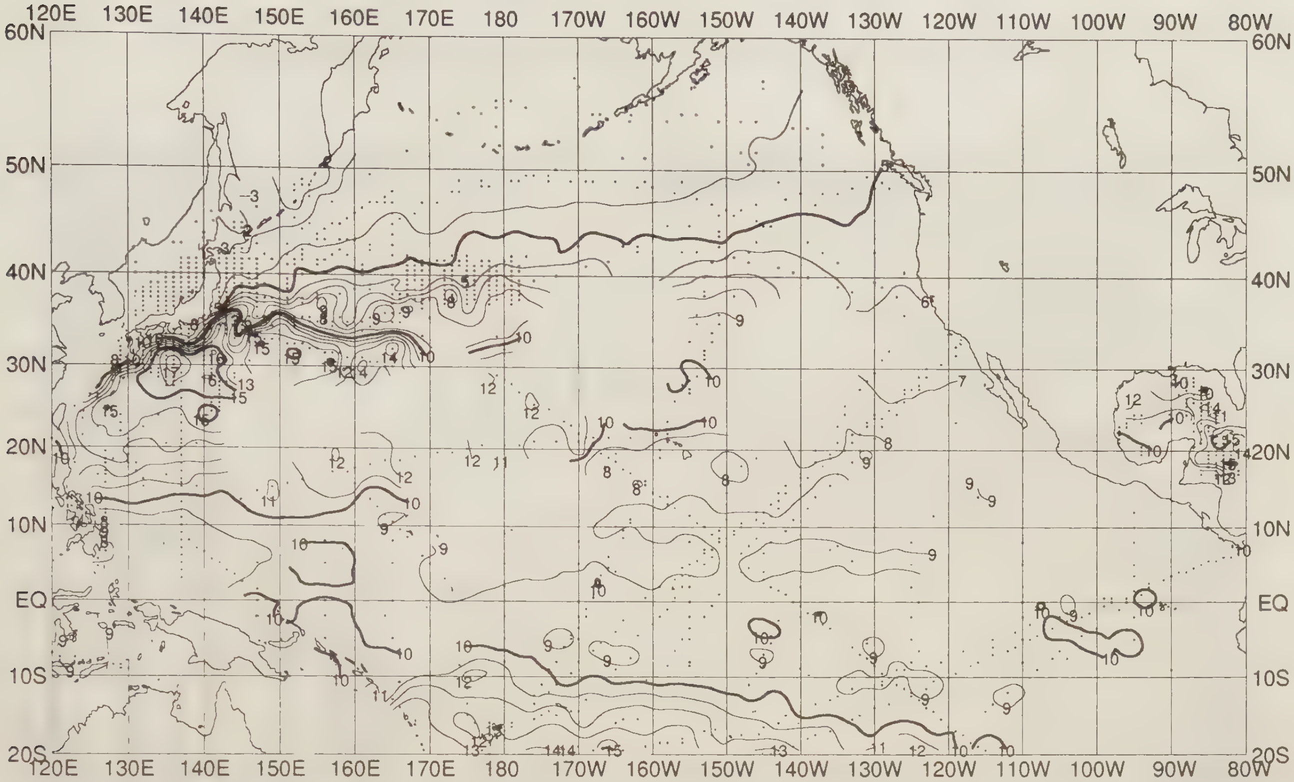
第 17 図　太平洋表層水温図（深さ 100 m）（2000 年 5 月）

Fig. 17　Subsurface (100 m) temperatures in the Pacific Ocean for May 2000. Contour interval is 1 °C. Observation points are denoted by dots.



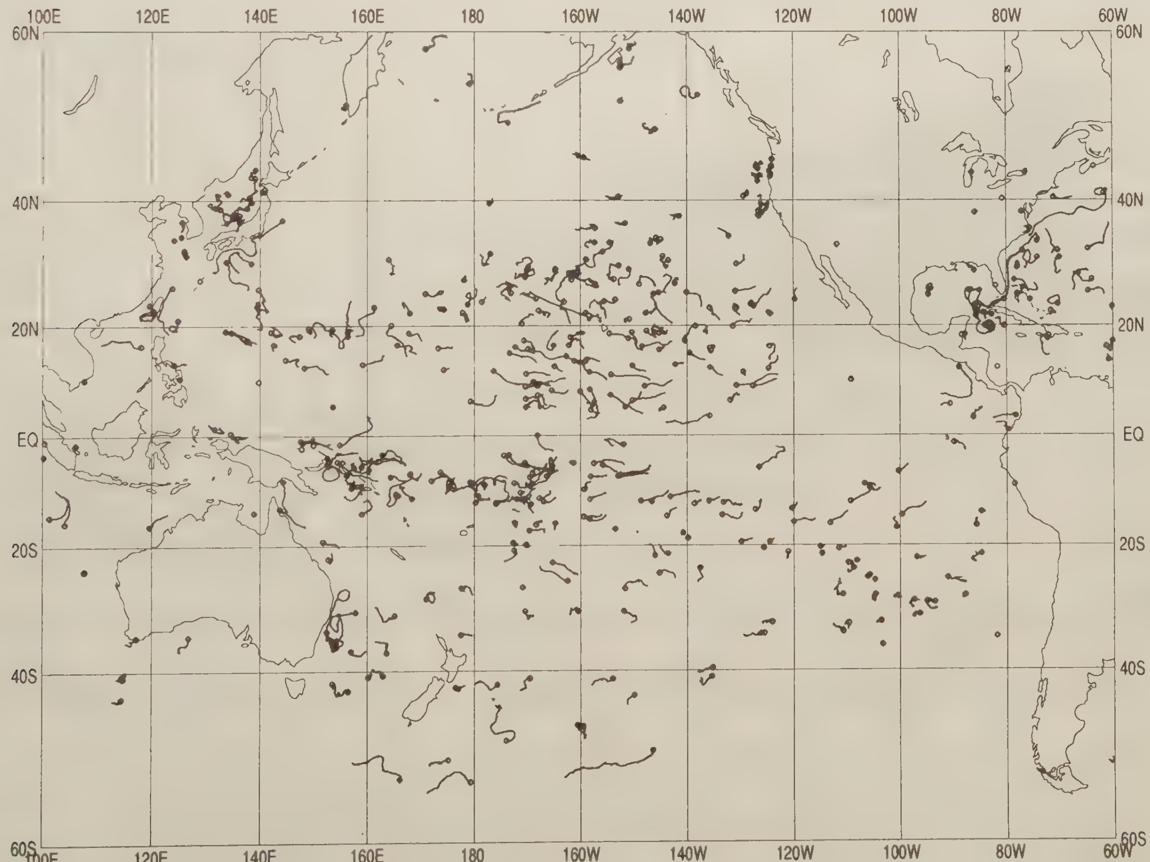
第 18 図　太平洋表層水温図（深さ 200 m）（2000 年 5 月）

Fig. 18　Subsurface (200 m) temperatures in the Pacific Ocean for May 2000. Contour interval is 1 °C. Observation points are denoted by dots.



第 19 図　太平洋表層水温図（深さ 400 m）（2000 年 5 月）

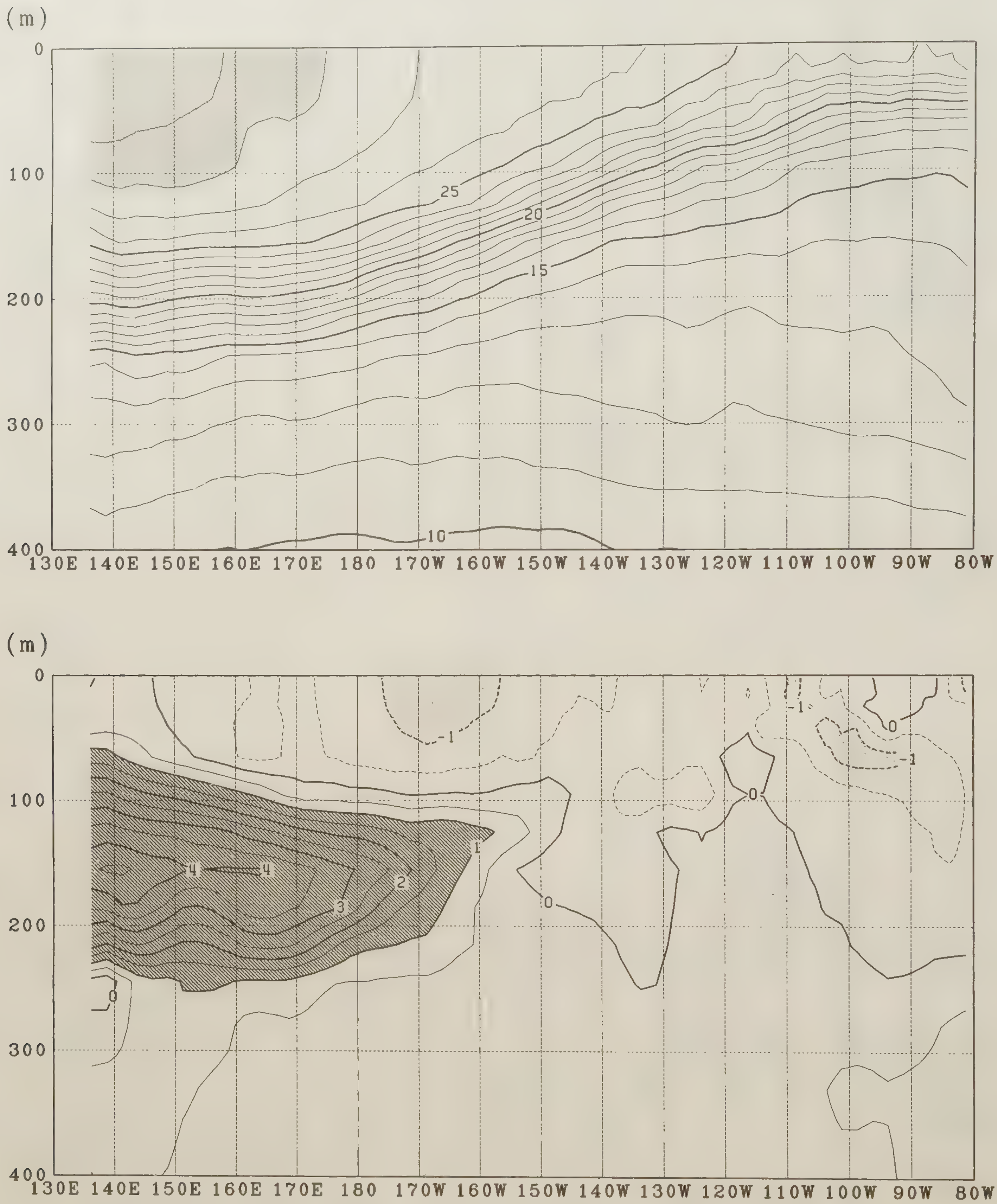
Fig. 19　Subsurface (400 m) temperatures in the Pacific Ocean for May 2000. Contour interval is 1 ℃. Observation points are denoted by dots.



第 20 図　太平洋ブイ流跡図（2000 年 5 月）

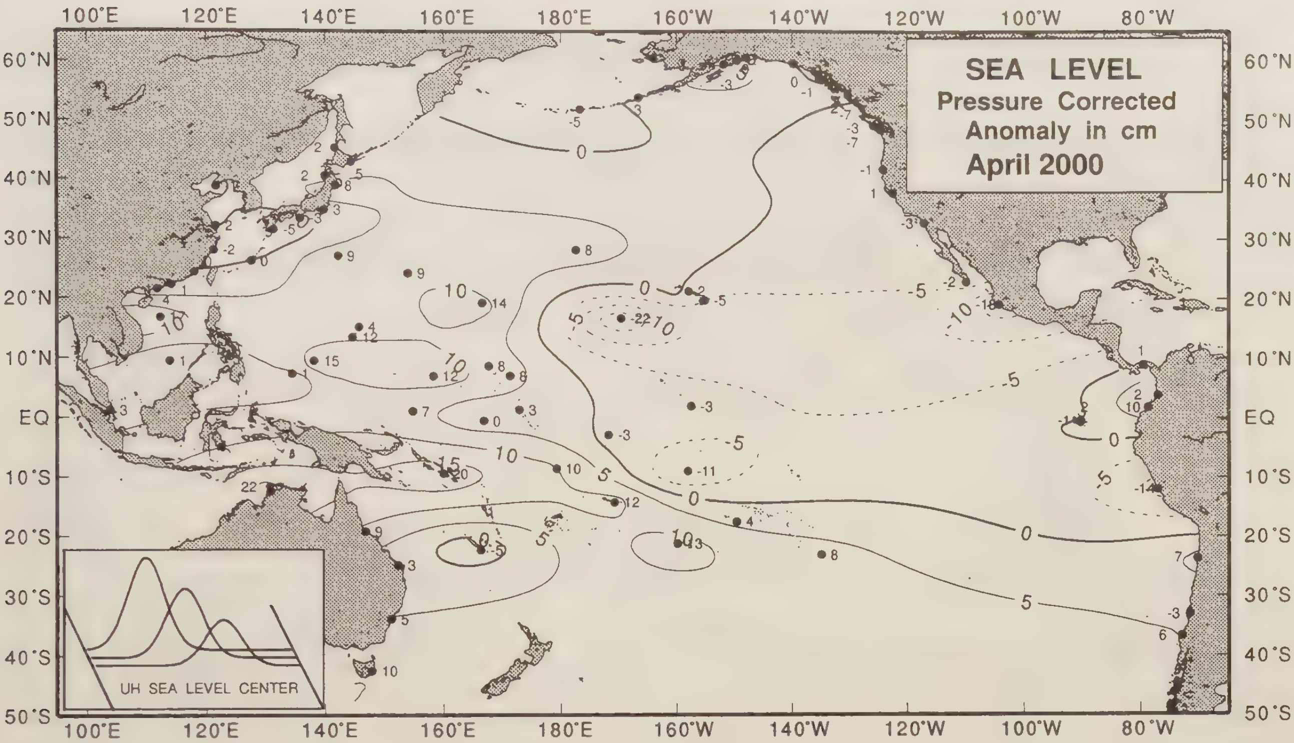
Fig. 20　Movements of drifting buoys in the Pacific Ocean during May 2000. Each track is for one buoy. Small circles represent the last positions for the month.

Depth-Longitude Sections of Equatorial Temperature & Anomalies



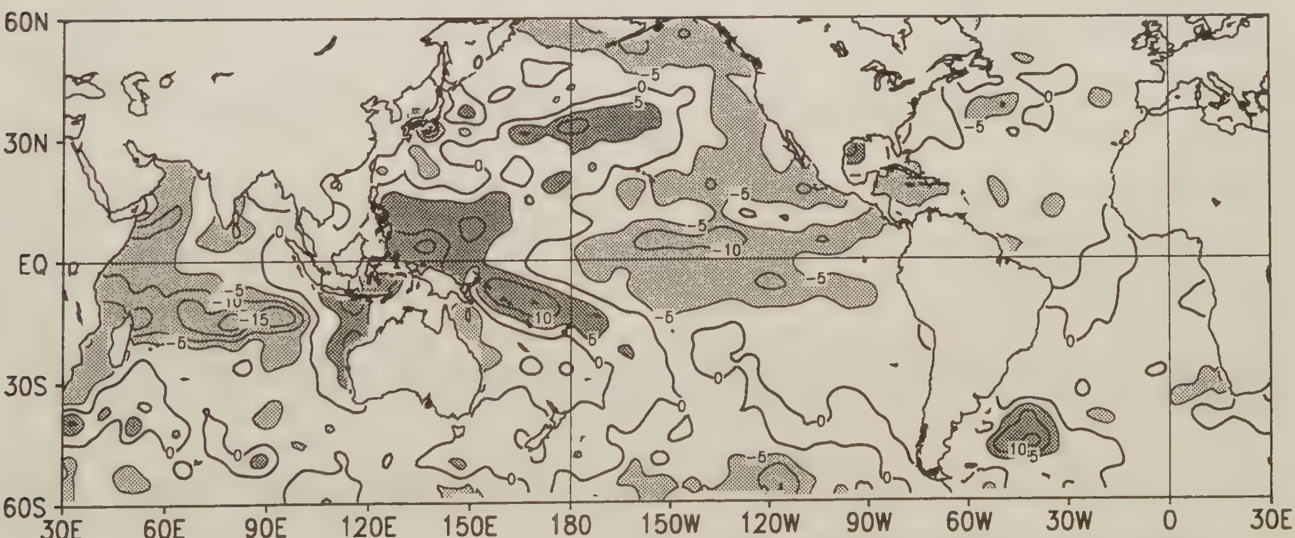
第21図　太平洋赤道に沿う表層水温（上）及び偏差（下）の深度－経度断面図（2000年 5月）

Fig.21 Depth-longitude sections of temperature (top) and anomalies (bottom) along the equator in the Pacific Ocean for MAY 2000. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (top) and 0.5°C (bottom). Values greater than 28°C in the top panel are shaded. In the bottom panel, values greater than 1°C are shaded and values less than -1°C are spotted. Anomalies are computed from 1987-1999 base period means.



第 22 図　太平洋月平均海面水位偏差図（2000 年 4 月）

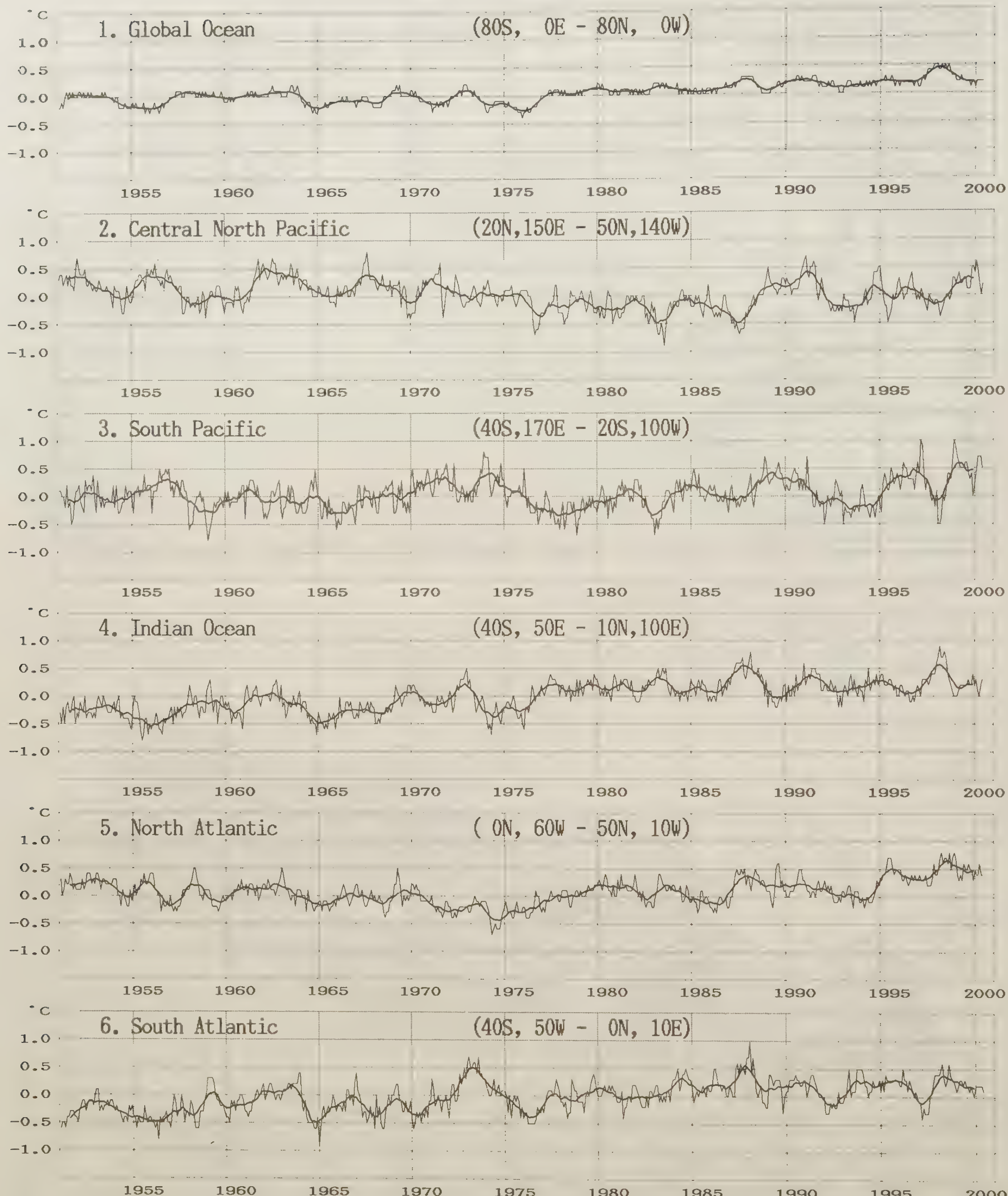
Fig. 22　Monthly sea level anomalies for April 2000 obtained from mean sea level (1975-1995) adjusted for atmospheric pressure. This figure is prepared by the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii.



第 23 図　全球月平均海面高度偏差図（2000 年 4 月）

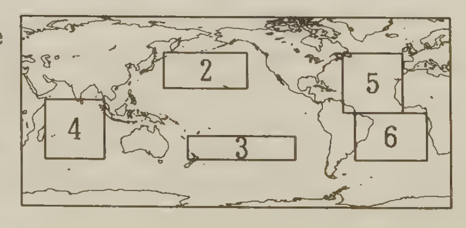
Fig. 23　Monthly sea surface height anomalies in the global ocean derived from the altimeter data of TOPEX/POSEIDON for April 2000. Contour interval is 5 cm. Positive anomalies exceeding +5 cm are shaded and negative anomalies exceeding -5 cm are spotted. Anomalies are computed from 1993-1998 base period means.

Long-term Variation of Monthly Mean SST Anomalies

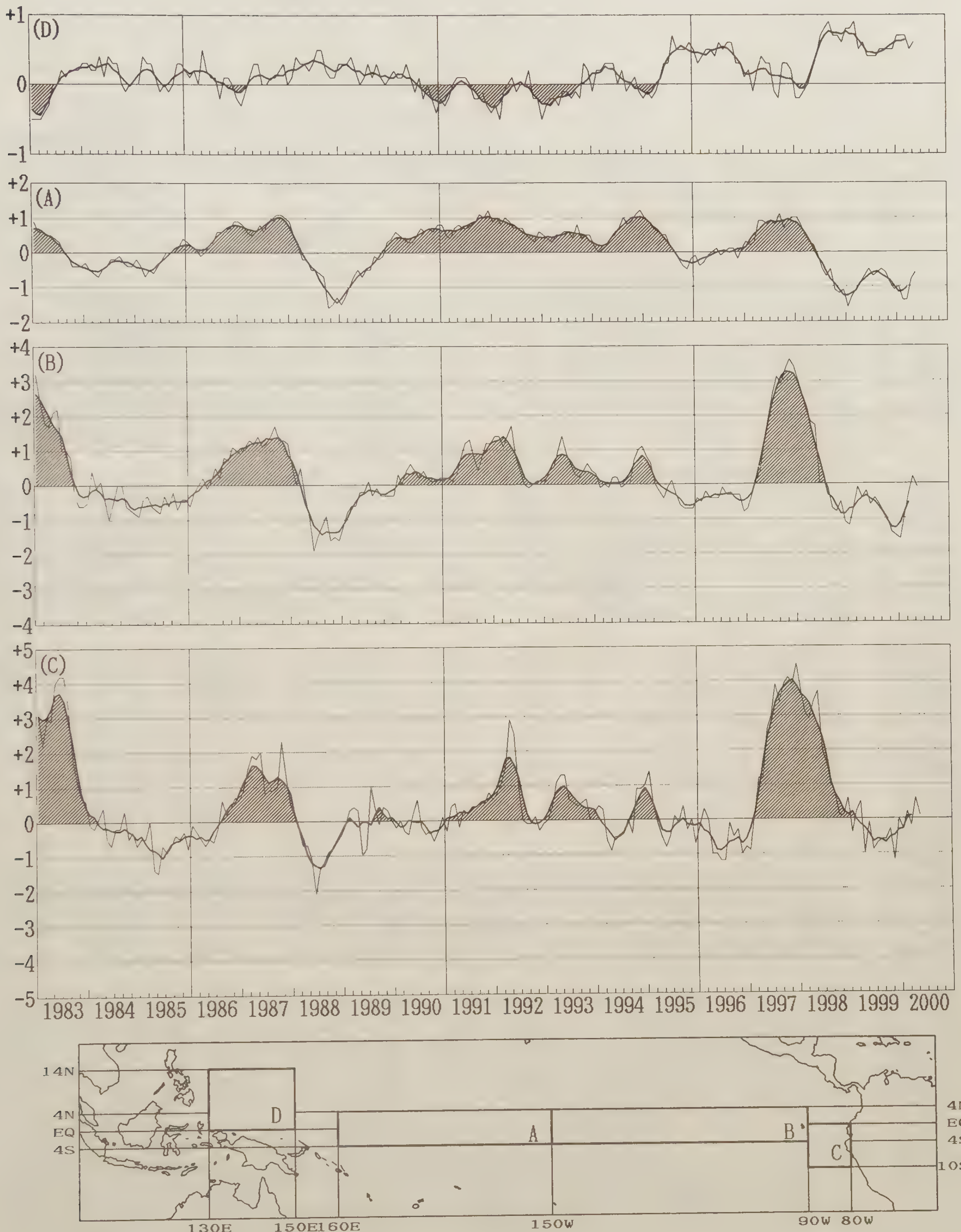


第24図 海域平均海面水温偏差の長期変動

Fig.24 Long-term variations of monthly mean sea surface temperature anomalies (°C) for the areas shown in the right panel. Anomalies are computed from the JMA climatology (1961-90). Thin lines show the monthly mean and thick lines their 13-month running means.



Time Series of Equatorial Pacific SST Anomalies



第25図　太平洋赤道域の海面水温偏差時系列図

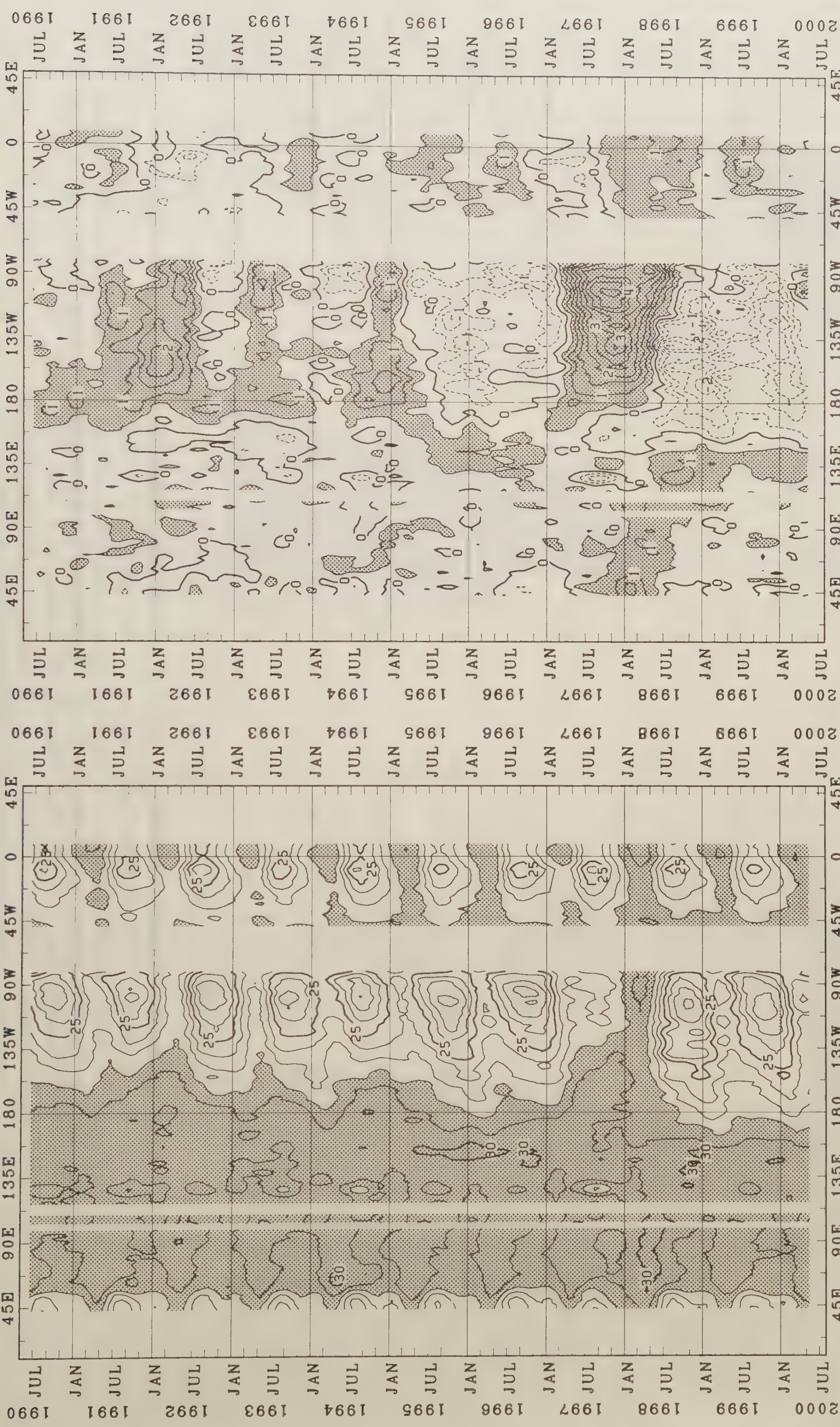
Fig.25 Time series of monthly mean SST anomalies (°C) in the equatorial Pacific Ocean for the areas indicated at the bottom panel. Thin lines show the monthly means and thick lines their 5-month running means. Positive anomalies (A, B, C) and negative anomalies (D) are shaded. Anomalies are computed from the JMA climatology (1961-1990).

El Nino Monitoring Indices

	SEA SURFACE TEMPERATURE AND ANOMALY (°C)								SOI	SEA LEVEL PRESSURE ANOMALY (hPa)	
MONTH YEAR	REGION D 14N-EQ 130E-150E		REGION A 4N-4S 160E-150W		REGION B 4N-4S 150W-90W		REGION C EQ-10S 90W-80W		SOI	TAHITI 17-33S 149-37W	DARWIN 12-24S 130-52E
JAN 98	28.3	-0.2	29.0	1.0	28.4	3.0	28.0	3.7	-2.3	-3.6	1.4
FEB 98	28.1	-0.2	28.8	0.8	28.8	2.6	28.8	3.1	-1.8	-0.9	3.5
MAR 98	28.3	-0.1	28.6	0.5	29.0	2.1	28.8	2.9	-2.5	-2.8	2.3
APR 98	28.8	0.0	28.5	0.3	28.9	1.8	28.5	3.4	-2.3	-1.5	1.4
MAY 98	29.3	0.2	28.7	0.2	28.3	1.7	27.6	3.7	0.0	0.4	0.5
JUN 98	29.7	0.4	28.4	-0.1	26.1	0.0	24.7	2.0	1.1	0.9	-0.5
JUL 98	29.9	0.7	28.0	-0.5	25.3	0.1	23.2	1.6	1.5	1.8	-0.6
AUG 98	29.9	0.8	27.7	-0.7	24.5	-0.1	21.7	1.1	1.0	1.4	-0.2
SEP 98	30.1	0.9	27.8	-0.5	23.9	-0.7	21.0	0.7	1.0	1.4	-0.4
OCT 98	30.0	0.7	27.3	-1.1	23.8	-0.8	20.8	0.1	1.2	0.8	-1.1
NOV 98	29.9	0.7	27.2	-1.2	24.1	-0.5	21.6	0.1	1.0	0.4	-1.5
DEC 98	29.5	0.6	27.1	-1.1	23.8	-1.1	23.2	0.6	1.5	1.1	-1.5
JAN 99	29.3	0.8	26.4	-1.6	24.2	-1.2	23.9	-0.4	1.5	1.8	-1.5
FEB 99	29.1	0.8	26.7	-1.3	25.5	-0.7	25.9	0.2	0.8	1.3	-0.6
MAR 99	29.3	0.9	27.0	-1.1	26.8	-0.1	26.4	0.5	0.8	0.4	-1.3
APR 99	29.3	0.5	27.3	-0.9	26.7	-0.4	24.1	-1.0	1.8	1.3	-0.9
MAY 99	29.7	0.6	27.8	-0.7	26.4	-0.2	23.8	-0.1	0.3	1.1	1.1
JUN 99	29.7	0.4	28.0	-0.5	25.5	-0.6	21.8	-0.9	0.1	0.6	0.4
JUL 99	29.6	0.4	27.8	-0.7	24.8	-0.4	20.9	-0.7	0.5	1.0	0.1
AUG 99	29.5	0.4	27.8	-0.6	24.0	-0.6	20.0	-0.6	0.0	1.3	1.1
SEP 99	29.7	0.5	27.8	-0.5	23.8	-0.8	19.7	-0.6	-0.1	0.2	0.4
OCT 99	29.8	0.5	27.8	-0.6	23.6	-1.0	20.4	-0.3	1.1	1.2	-0.4
NOV 99	29.7	0.5	27.5	-0.9	23.2	-1.4	20.3	-1.2	1.1	1.2	-0.9
DEC 99	29.4	0.5	27.1	-1.1	23.4	-1.5	22.6	0.0	1.5	1.9	-0.9
JAN 00	29.2	0.7	27.0	-1.0	23.8	-1.6	24.0	-0.3	0.4	1.3	0.3
FEB 00	29.0	0.7	26.6	-1.4	25.3	-0.9	25.9	0.2	1.1	2.6	-0.2
MAR 00	29.1	0.7	26.7	-1.4	26.6	-0.3	25.7	-0.2	1.0	1.6	-0.3
APR 00	29.3	0.5	27.4	-0.8	27.3	0.2	25.7	0.6	1.4	0.8	-1.0
MAY 00	29.7	0.6	27.9	-0.6	26.5	-0.1	24.0	0.1	0.3	0.8	0.7

第1表　エルニーニョ監視指数

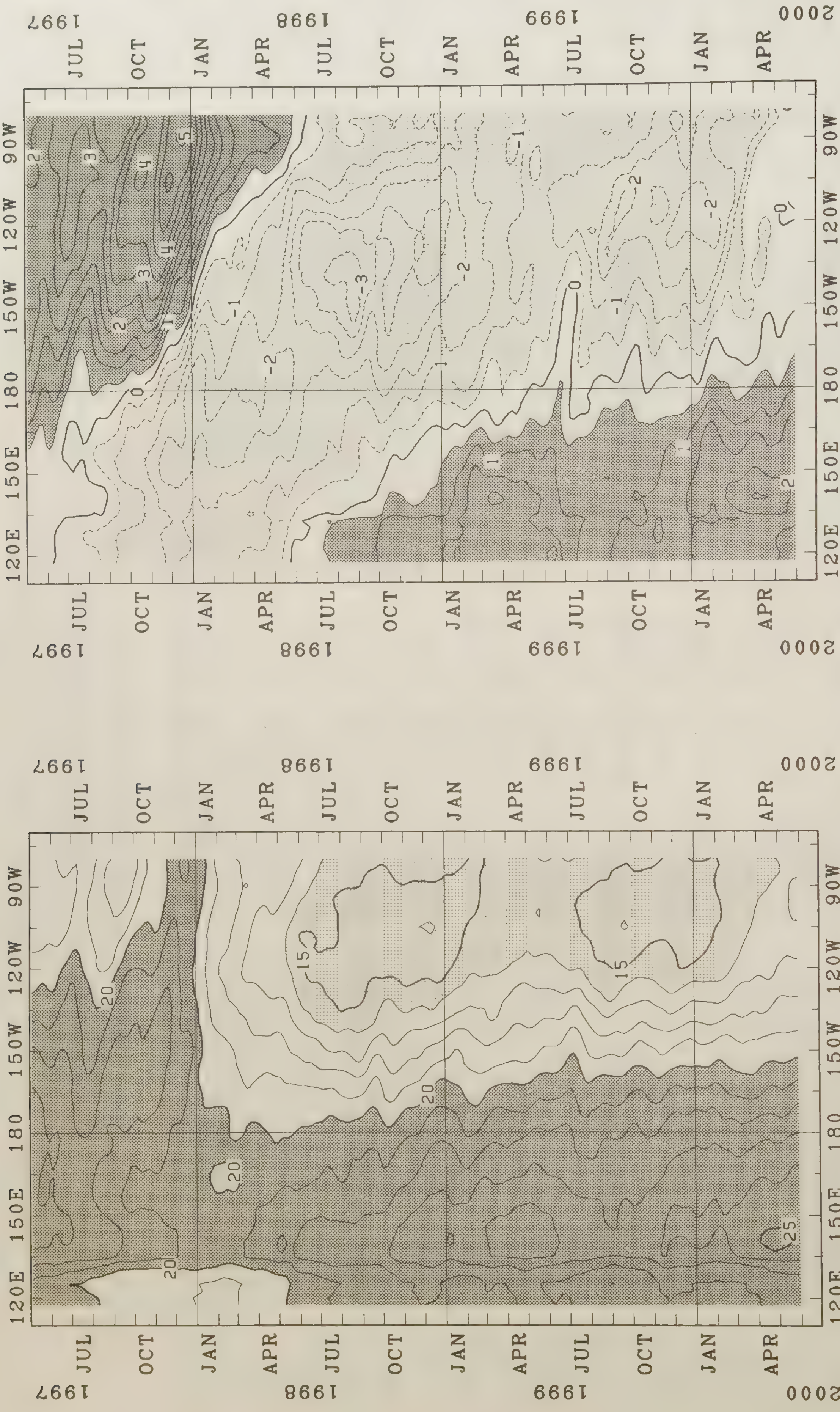
Table 1 El Nino Monitoring indices



第 26 図　赤道に沿った海面水温（左）及び偏差（右）の時間-経度断面図

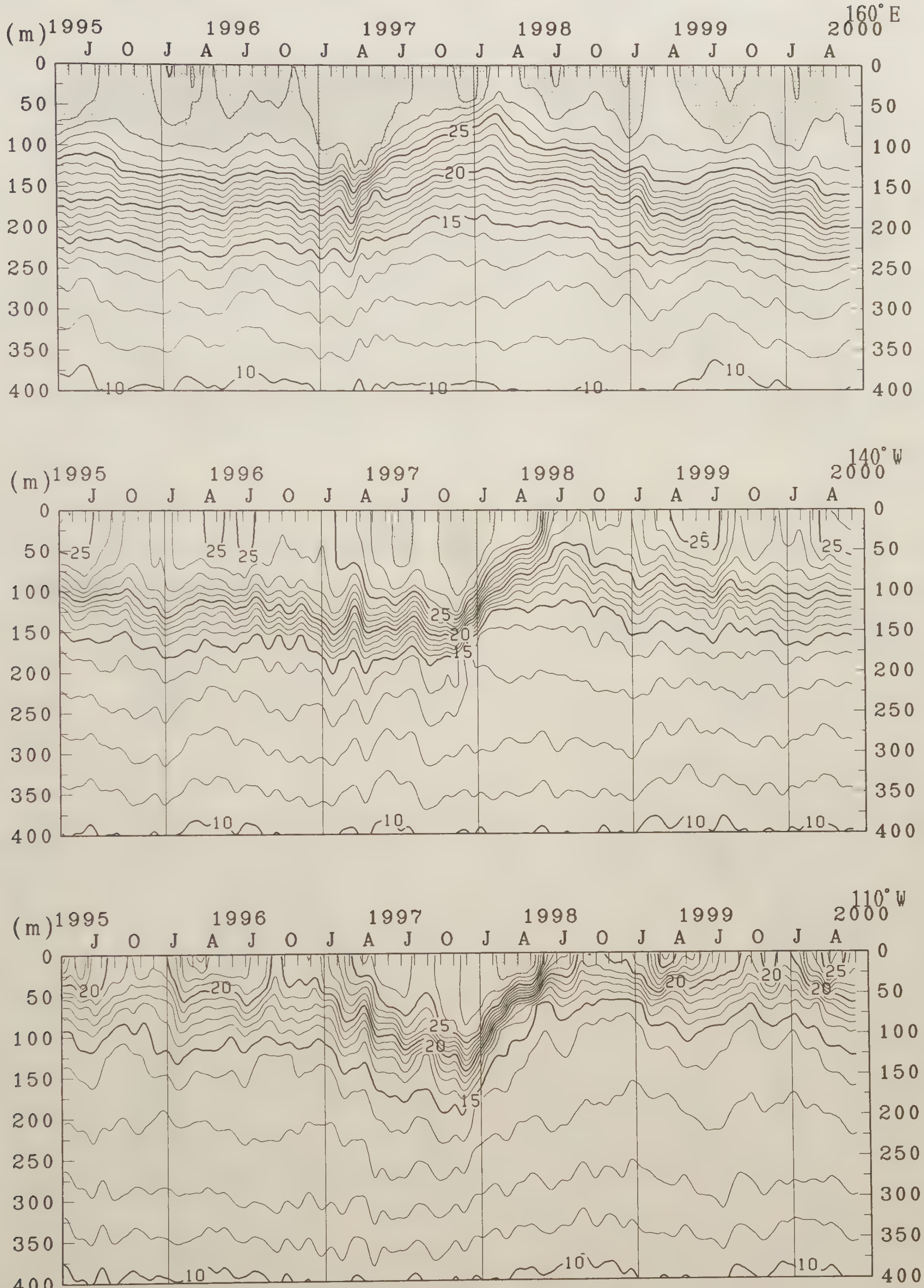
Fig. 26　Time-longitude sections of SSTs (left) and anomalies (right) along the equator (2 °N-2 °S) in the global ocean. Contour interval is 1 °C (left) and 0.5 °C (right). Values greater than 28 °C are shaded and values less than 23 °C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1961-1990 base period means.

Time-Longitude Sections of Ocean Heat Content & Anomalies (Eq.)



第27図　太平洋の赤道に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

Fig.27 Time-longitude sections of ocean heat content in the upper 260 m along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (left) and 0.5°C (right). Values greater than 20°C are shaded and values less than 16°C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1987-1999 base period means.



第28図　太平洋赤道域の表層水温の時間－深度断面図

(上：西部、中：中部、下：東部)

Fig.28 Time-depth sections of equatorial subsurface temperature for the western Pacific (top, 160°E), the central Pacific (middle, 140°W) and the eastern Pacific (bottom, 110°W). Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C. Values greater than 28°C are shaded.

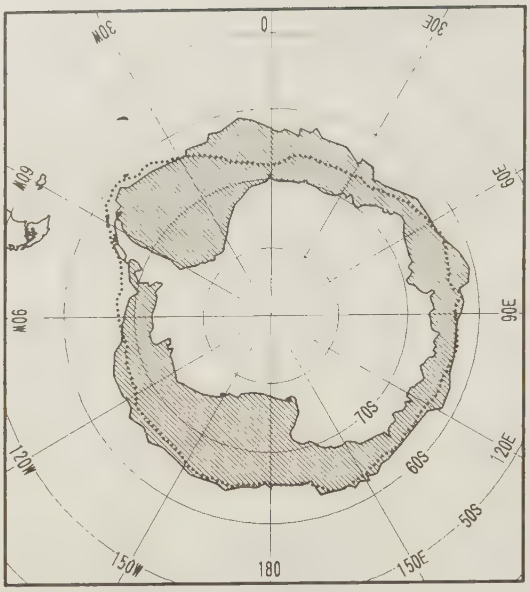


第29-1図　北極域の海氷図（2000年 5月18日）

Fig.29-1 Sea ice chart in the Arctic on 18 May 2000.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1972 through 1990.

The data source is the National Ice Center (USA).

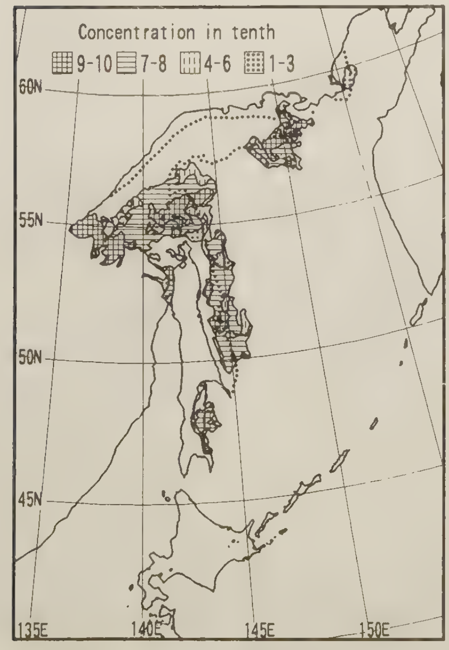


第29-2図　南極域の海氷図（2000年 5月15日）

Fig.29-2 Sea ice chart in the Antarctic on 15 May 2000.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1973 through 1990.

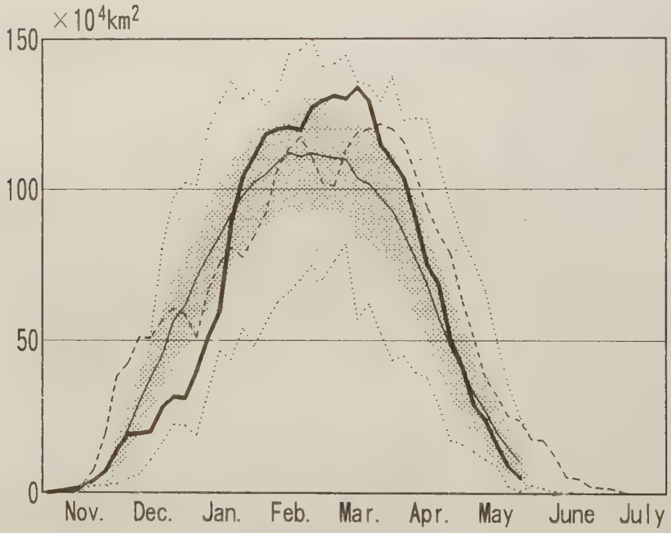
The data source is the National Ice Center (USA).



第29-3図 オホーツク海の海氷図（2000年 5月15日）

Fig.29-3 Sea ice chart in the Sea of Okhotsk on 15 May 2000.

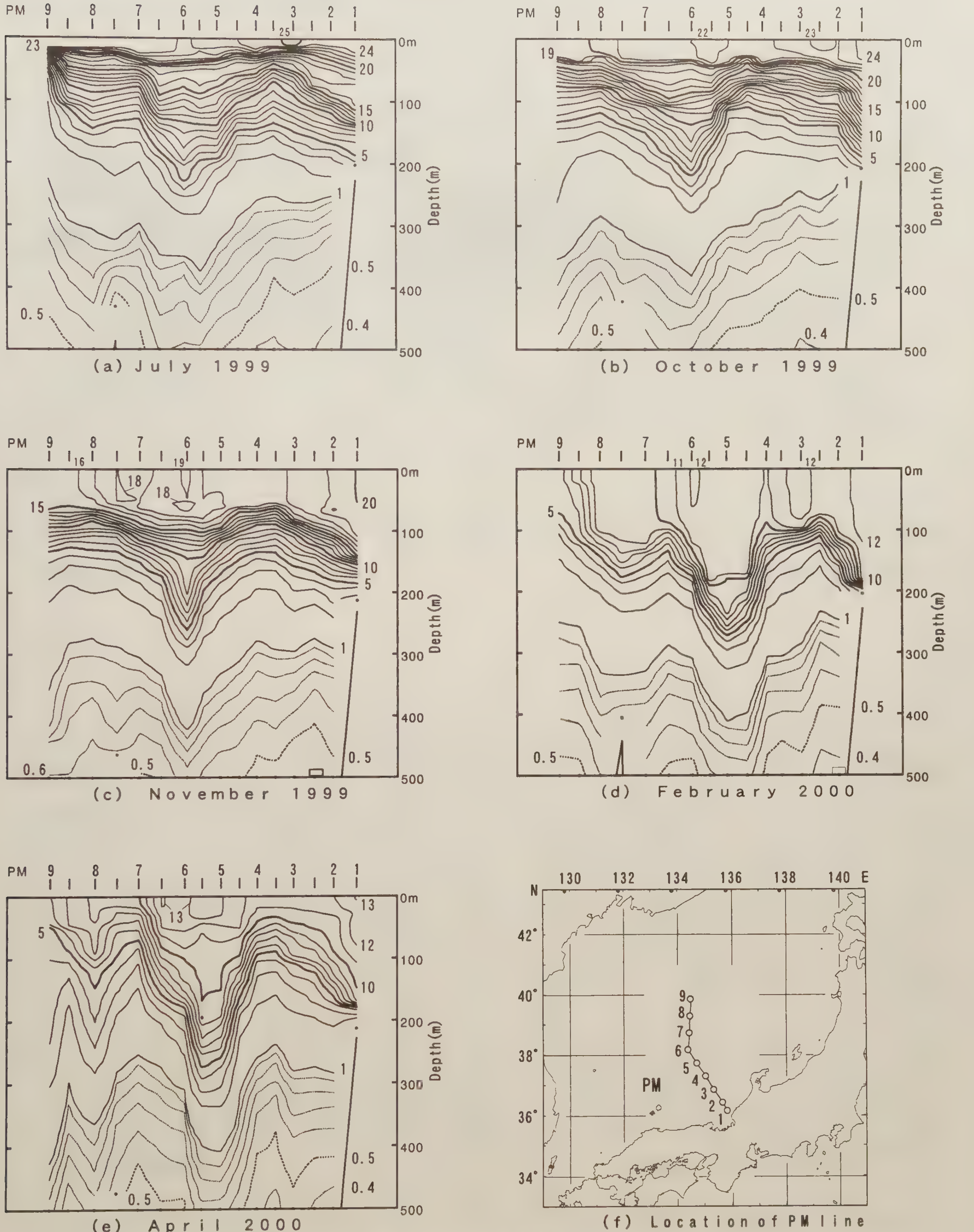
The dotted line denotes the mean ice edge averaged for the period from 1971 through 1995.



第29-4図 オホーツク海の海氷域面積

Fig.29-4 Time-series of 5-day sea ice extent in the Sea of Okhotsk.

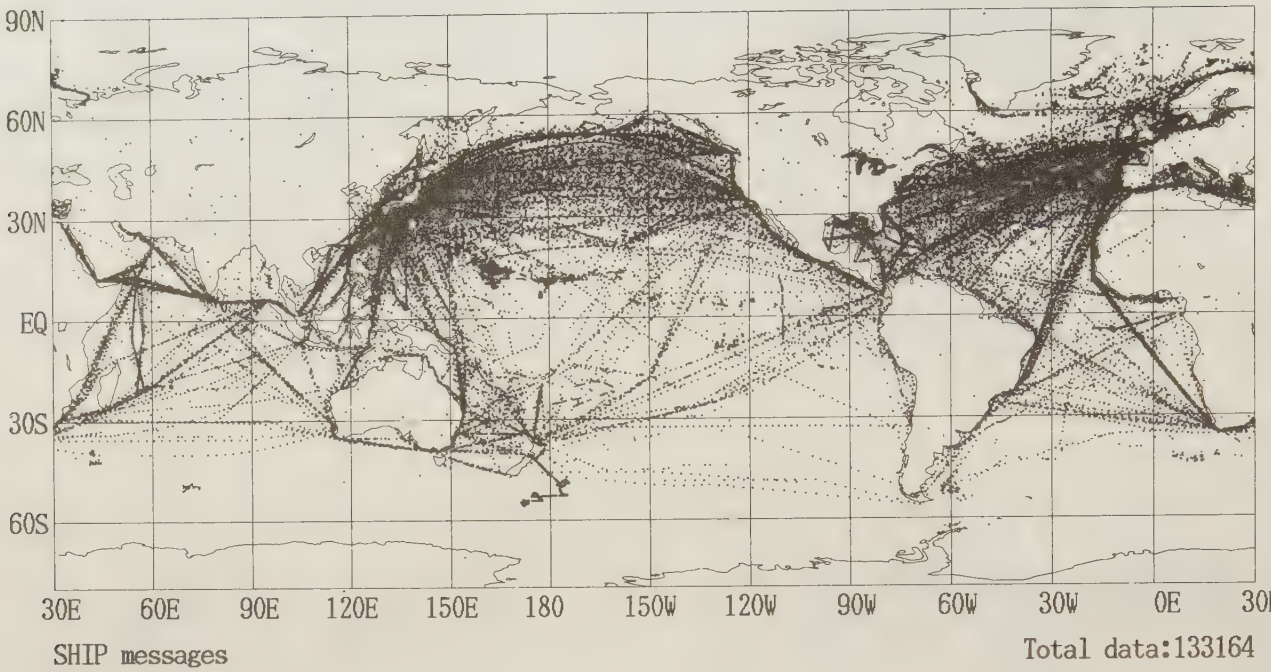
: current season (1999/2000)
: mean extent (1971-1995)
: maximum or minimum extent (1971-1999)
: last season (1998/1999)
: mean $\pm 1\sigma$ (1971-1995)

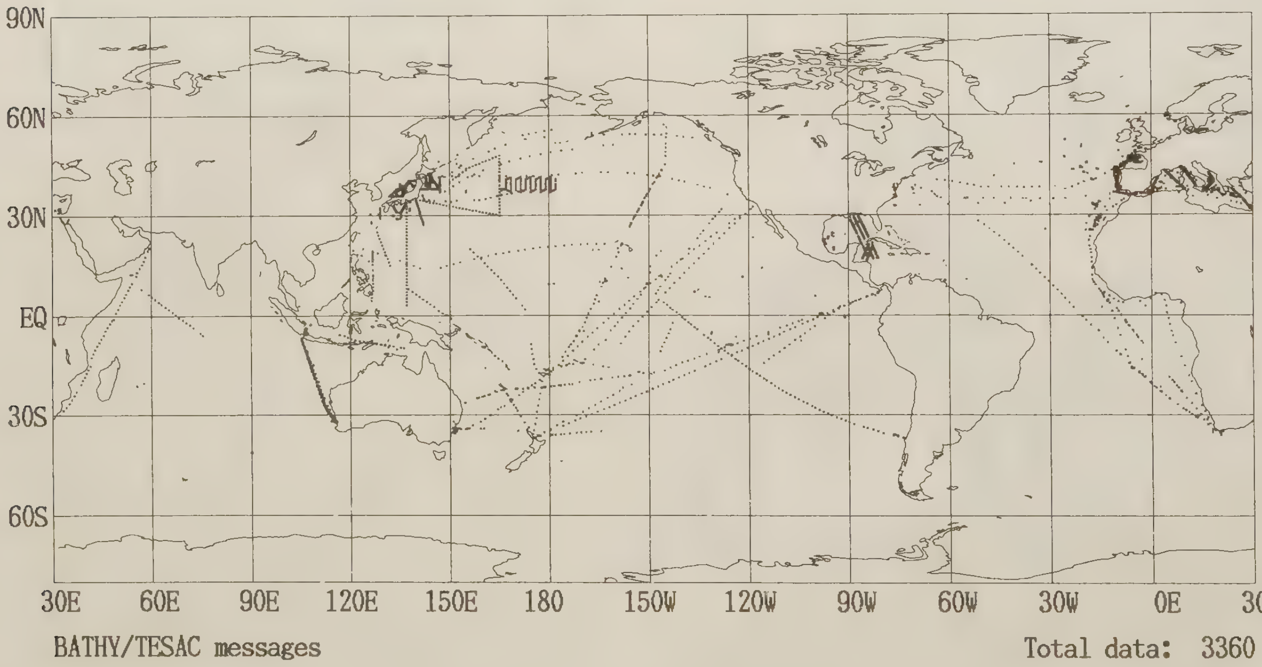


第30図　舞鶴海洋気象台清風丸によるＰＭ線に沿った水温鉛直断面図(℃). (a) 1999年7月, (b) 1999年10月, (c) 1999年11月, (d) 2000年2月, (e) 2000年4月, (f) ＰＭ線の位置図.

Fig. 30　Vertical sections of water temperature(℃) along PM line by R/V Seifu Maru of Maizuru Marine Observatory, JMA. (a) July 1999, (b) October 1999, (c) November 1999, (d) February 2000, (e) April 2000, (f) Location of PM line.

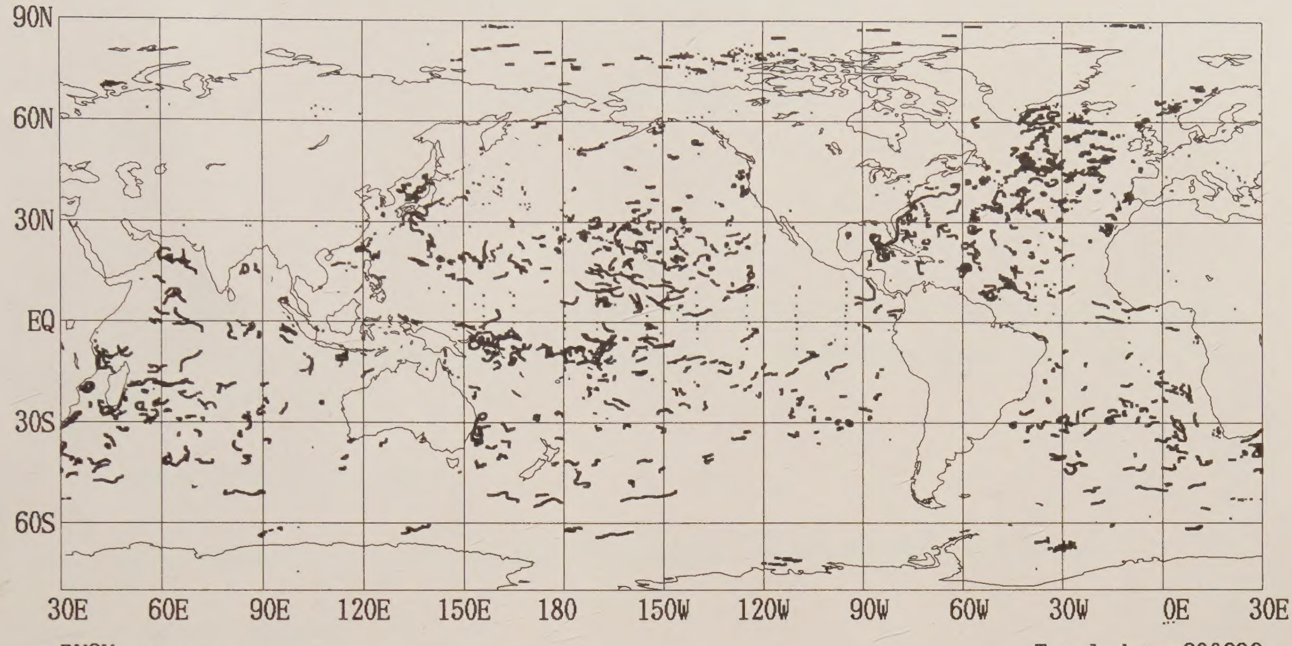
Geographical Distribution of Oceanographic Data



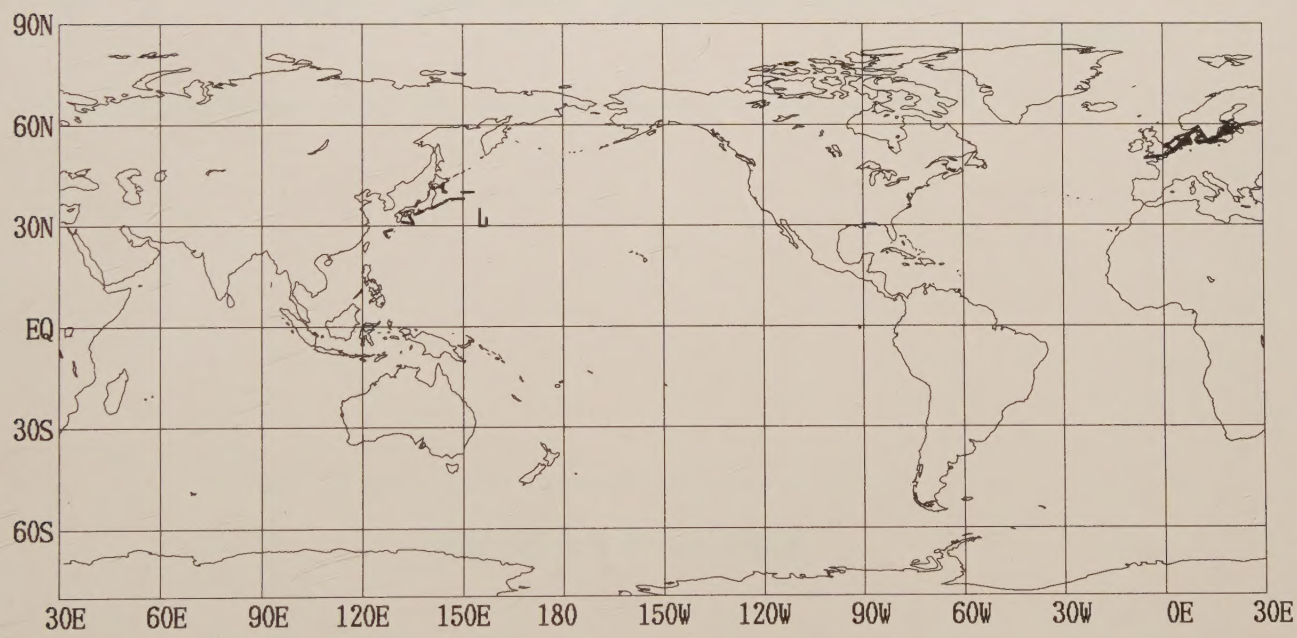


第31-1図　測点分布図(2000年 5月)

Fig.31-1 Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for MAY 2000.



BUOY messages Total data:280232



TRACKOB messages Total data: 1074

第31-2図 測点分布図(2000年 5月)

Fig.31-2 Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for MAY 2000.



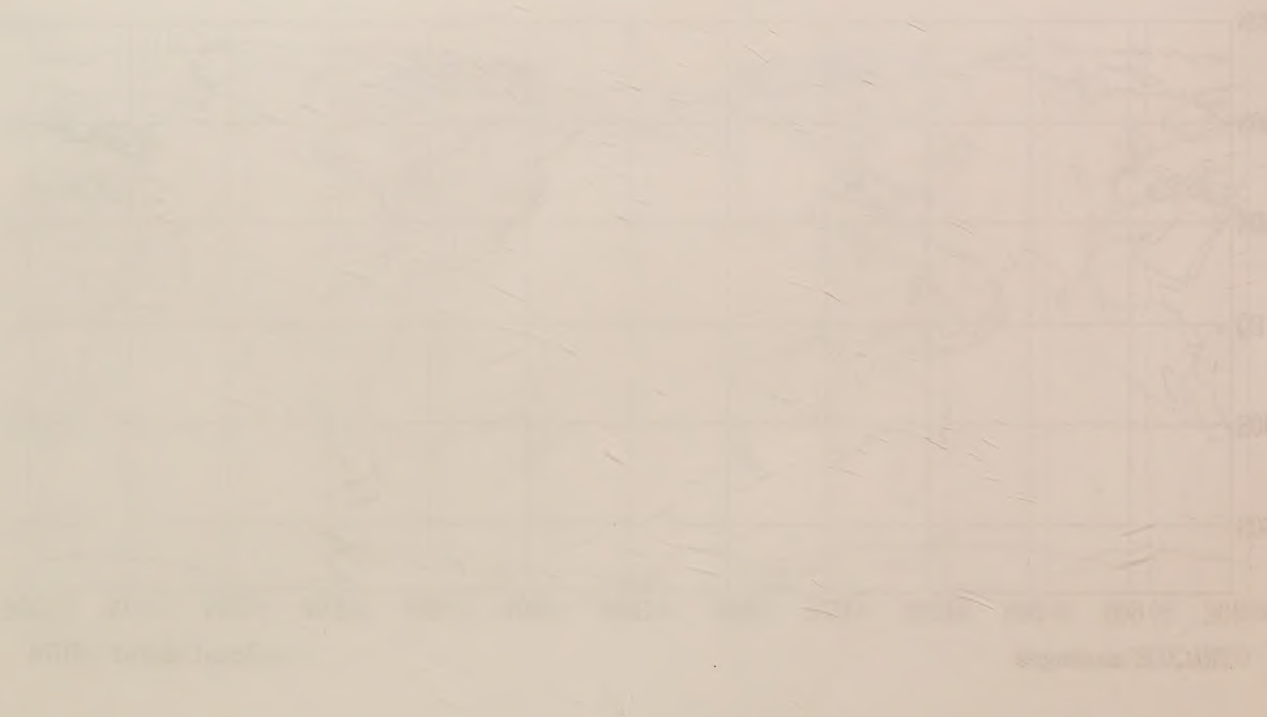


Fig.31-2 [illegible]
and SST data, [illegible]
(below) for MAY [illegible].

気象庁海洋月報

Monthly Ocean Report

May 2000 (No. 89)

本月報掲載の 2000 年 5 月のプロダクトには、気象庁が観測したデータ及び GTS（全球気象通信網）を通じて入手した国際気象通報式による通報のほか、下記の機関等から提供いただいたデータを使用しています。御礼申し上げます。

防衛庁、水産庁、海上保安庁

海洋科学技術センター、（財）日本海洋科学振興財団、（社）漁業情報サービスセンター

東北大学、東京大学

水産試験場等（北海道、青森県、岩手県、宮城県、秋田県、山形県、茨城県、東京都、新潟県、富山県、石川県、福井県、静岡県、愛知県、三重県、京都府、兵庫県、和歌山県、鳥取県、島根県、山口県、高知県、佐賀県、長崎県）

（順不同）

平成１２年６月２２日発行

編集兼発行所　気　象　庁
東京都千代田区大手町１-３-４

印刷所　モリモト印刷株式会社
東京都新宿区東五軒町３-１９